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HOW TO LIVE IN THE COUNTRY



14 DAYS
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BY E. P. POWELL

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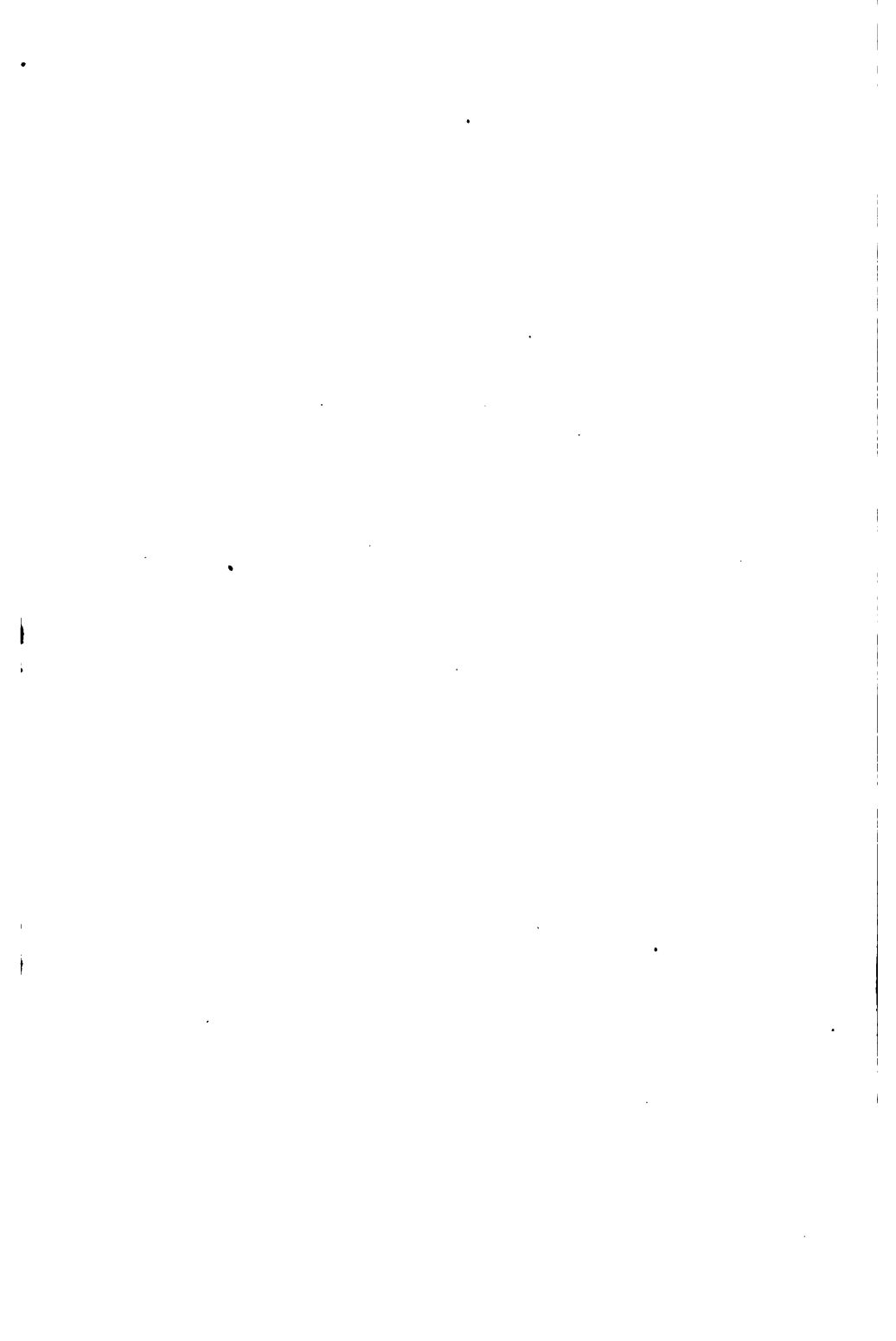
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**HOW TO LIVE IN THE
COUNTRY**



Photograph by Paul Thompson.

THE ROAD TO THE COUNTRY HOME — AND HAPPINESS

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HOW TO LIVE
IN THE COUNTRY

BY
E. P. POWELL

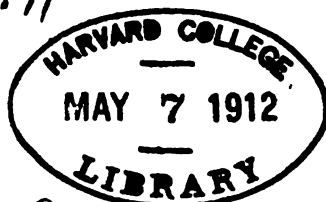
With a Foreword by N. O. Nelson

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FOREWORD

BY N. O. NELSON

In writing a foreword to this book, I am spokesman for a multitude of readers, who join me in deep gratitude to the author for the practical wisdom and the joyful spirit he has put into his writings. He speaks from his own experience, and he knows birds as well as Burroughs, fruit as well as Burbank, intensive farming better than Kropotkin, and more than any other writer does he know the whole round of farm life and country attractions.

In exploiting the positive delights of country life Mr. Powell has no rival. He takes them all in; the beauty, the poetry, the health, independence, and daily interests. There are pitfalls in farm life, not the least of which are the exaggerated hopes, inspired by special crops, machinery, pedigreed animals, climate, and market; he leads us into none of these. He advocates the farm as a home, not for exploiting hobbies, but where one may live a full life, round and rich.

I go back to my boyhood when we had another kind of farming, with more acres and ruder ways. We raised our living, and had something to sell. There was school in winter and work all the time.

FOREWORD

Hired hands were rare exceptions, and so were tenants. Every man with every member of his family worked his own farm; was industrious, independent, and needed little that he could not raise.

To go from that picture to the great factory multitudes of to-day may well make angels weep. One city family out of ten may own its own home, but not one-half that number has a month's living ahead. A panic is a disaster, and old age is a calamity. We know from history that a country's yeomanry is its strength and the city rabble its destruction. It needs all the enlightenment and warning of books like this to help stem the tide, and if possible to turn it.

You readers know that Mr. Powell has never written a dull article, or misstated facts, or wasted a paragraph on an idea not worth the while. But few of you have seen, as I have, the nine acres on which he has these forty years learned the solemn facts which he is telling us. Nearly eighty years of age, his farm and his pen are as prolific as ever. George Jacob Holyoake wrote that great book, "Bygones Worth Remembering," in his ninetieth year; Edward Everett Hale did some of his best work in his eighty-ninth year; and Mr. Powell shows a defiance of years in recently making himself a winter farm home in Florida. He migrates with the wiser-than-we birds to his New York home in time for pruning and planting and to his lakeside Florida home after harvesting.

FOREWORD

The fatal trend toward the deadly city no preaching has been able to stop, but toward saving some of the more rational no one has done so much as Mr. Powell with his fascinating, true, and persuasive stories about all sides of country life. "Back to the land" is no longer the slogan with which we must do our work, but "Stay on the land where you are"; and to this we all say amen. It is his noble sentiment and fixed opinion, which he delightfully illustrates, that farming is the highest and best of callings; full of interest, responsive to intelligence and skill, building health, manhood, and independence. It pleases me much to have the opportunity of putting a foreword to this book; I wish it may have a million readers, keep a million boys from straying away from the farm to the factory, and that it may be translated into a score of languages.

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HOW TO LIVE IN THE COUNTRY

HOW TO LIVE IN THE COUNTRY

CHAPTER I

FINDING THE PLACE

I PROPOSE a book that shall be helpful to those who desire to create country homes. I shall let the mansions well enough alone, for I have no interest in seeing costly residences on our hill-sides that few can afford to occupy and that no one can make pay. These are extravagances that are apt to display only the wealth of their owners. They create tenantry and retinues of servants instead of freeholders and free men. They are not a growth of the land, coming up out of the needs of the people, but they are a transplantation of the city into the country; and wherever they are, the simplicity of Nature is compelled to give way to the artificiality of display. The violet goes, and the lotus pond comes in; and there is nowhere a smell of the wild mint left.

What I shall hold myself to strictly is helping the men of moderate means, who intend to live

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wider and warmer and think nobler and develop both food and character by intimacy with Nature. I have a warm feeling for those who are tired of city life or town life, and desire to react from artificiality.

In 1890 the census told us that the cities were receiving over sixty-six per cent of the increase of population, although I believe the tide was even then slowly turning. In 1900 it was found that only a little over thirty per cent of the annual increase dropped into city congestion — notwithstanding the enormous increase of immigration. This was a splendid showing for the country and country life, and we are happy to know that the ratio has been steadily increasing ever since. At present there is not much over twenty per cent of the people lost to the hills and valleys, that is the new folk.

This, of course, does not mean that the cities are decreasing in size; only that their ratio of growth, with the single exception of New York City, is growing less. It means that country life has at last attractions that counter-balance the attractions of the town. The country telephone, rural free mail delivery, and the trolley are a triple alliance to make the home in the remote glen or the farm on the mountainside hardly more isolated than the apartment in a city flat. Neighbors are joined together so that they can converse freely and coöperate more easily. The trolley is even hauling farmers' wagons to market; backing up to the barn doors and taking

long trains of grain as well as passengers. The automobile is going farther, although for the present it has not outgrown its aristocratic youth. Any town with half a dozen of these motors is quite as independent as a town on a railroad line served once a day by a freight train.

At any rate the spirit of "back to the land" has gained a wonderful momentum, and nothing better can be done with our experience than to sift it carefully for the help of those who are quitting the congested street for the sod and rose lawn. It is not so simple a problem as appears on the surface, for the country is far from having a welcome for all comers, nor is it ready to locate and support an indefinite number of applicants who have no knowledge of earth culture. So far as knowledge is concerned, much less is required of the city dweller, who has little more to do than to furnish his "apartments," or hire a conventional house and pay his rent and water taxes.

But if you would have a garden, or a farm, or a fruit orchard you must know what you are about, and you must study every tree and every shrub; you must know the soil and the lay of the land thoroughly. You must know a good deal about the birds of the locality, for that counts very heavily in gathering your crops; some birds are your best allies, while others are a serious pest; you must know a good deal more about insects, for the beetles and moths are your main rivals; and then you can-

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not safely be ignorant of simple botany — you must at least know the difference between poison ivy and Virginia creeper.

When planting you have to choose from a catalogue of one hundred varieties of apples, fifty of pears, and twenty-five of cherries. You cannot grow more than a dozen probably — perhaps only five of each class. You must find out which suits your soil and your climate, and which are most subject to local diseases and insect foes. So with everything you touch. There is no question about your making mistakes; the aim is to help you make as few as possible. You are at once to take up the rôle of student and become an investigator.

In other words, anyone who would become a country home-maker is confronted, at the very outset, with the demand that he become something of an ornithologist, a geologist, a botanist, and an entomologist. Of course he will be an amateur and a beginner, but a sincere student he must be, or fail. This is much more true than formerly, because our insect rivals are increasing in number, and the art of combating them is complex, while the number of fruits and vegetables has been multiplied by one hundred. A well-organized country home is an affair not too often found.

At the outset you are liable to make serious blunders in location. A good deal of the land is not in a condition suitable for an amateur home-maker, and I am sorry to tell you that this is the very land

that will be offered you with all sorts of advertisement and promises. Do not buy an acre of soil until you have personally examined it, and even then you must judge with a bias against the proposition. At least two-fifths of New York State knows nothing about tillage, is still in the swamp or brushwood state; and there are millions of acres in the United States that even experts cannot subject to purposes of home-making.

Within easy reach of New York City there are hundreds of acres unsuitable for homesteads, owing to the impossibility of good drainage, or the uncontrollable presence of insects, or for other reasons. The mosquito owns a good slice of New Jersey and one third of the State of Florida, and a good deal more all the way up and down the coast. Degeneration has followed those who undertook to live in some of the higher lands of the Alleghenies. Flat, moist, and mucky land will be all right for truck gardening, but those who are going for health as well as pleasure and profit must avoid any location infected with malaria and supplied with insects to convey the poison.

The first point to consider is a soil of sufficient depth to respond to cultivation. It is true that you must make soil for yourself, and in another chapter we shall talk over that matter very thoroughly. It is not true that you cannot create soil for yourself, and a good deal of this you must do in the best localities; but if you begin on a barren piece of soil

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you start at a great disadvantage and are not likely to remain long in the country.

I do not know of any easier way, as a general rule, to judge of the soil than by the size and thrift of the trees that are growing in it. If you find a huge apple tree, or a grove of fine maples, or oak trees spreading themselves over a diameter of sixty feet, or even pine trees standing eighty feet high, do not be afraid of the soil, even if it is very sandy. If you wish to grow fruit, as a rule you must prefer good strong clay, with about twenty per cent of sand; if you want to grow celery and other vegetables mucky soil with a good admixture of sand should be the chief point to consider.

As a rule, low land is colder than high land, and a slope of hillsides to the east is decidedly preferable for a long-growing season. You may even find that a short distance of an eighth of a mile will make a difference of two months, by cutting off the latest frost in the spring and the earliest in autumn.

The lay of the land is important for more reasons than I have hinted above. The morning sun is the growing sun, and this you will discover by examining a conservatory on the east front of a house as compared with one on the west. Gathering the sun's heat during the day much more freely, these eastern dells and swales will bring to perfection fruits that cannot be grown successfully in any other location.

This is not quite true of peaches, for the chief trouble with their fruit buds is that they are started

or softened by winter suns, and in this way are less liable to resist late frosts. So if you are designing to plant a peach orchard you want a northern exposure. This is partly true of some of our pear trees and cherry trees. Winter thawing is more dangerous than a steady all winter freezing.

If possible, select easy slopes that take drainage readily, rather than steeper hillsides that carry off the water with a dash, and with it a great deal of soil. This is one of the chief troubles with our country-home life, that we are losing soil by winter wash and summer showers — often faster than we are making it.

You will be surprised, perhaps, at my placing the matter of wind-breaks so prominently in my advice as to location. If you cannot snuggle down behind a hill to break the force of dominant winds, see if you cannot get behind a nice bit of forest, or at least a line of woodland. If you cannot, you must make a wind-break as soon as possible. At all events, let it be kept clearly in mind while selecting a location that you do not wish to plant your house where the full blast of northeasters or northwesterners will strike against you. They will not only put an edge on your climate and uproot your trees, but they will sweep the moisture off your land and make you the victim of drought.

We shall talk a good deal more about this by and by, but meanwhile if you can get the protection of an already-grown wind-break it will count enormously

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for your comfort and your crops. Look out for a good evergreen screen; but best of all is it to nestle down in the warm hollows under a ridge of hills.

It is absolutely necessary that your country property be capable of good drainage, and it is equally necessary that it get such drainage. This does not always demand a hillside, or even much of a slope, but for health and for tillage alike it is an absolute requisite; without health you had far better be in the city. There are locations also which become undesirable because they take the wash of neighbors' drains. The law will hardly protect you in such a case, and if it does, lawing is the last thing that you wish to engage in. I would make sure not to buy my way into a quarrel.

Involved in this drainage problem is, once more, that of soil wash. Many of our hillsides are being denuded of all valuable dirt and fertilizers are swept away as fast as they are applied. Look out for this, of course, in your purchasing; that is, select your property with a clear vision and a certain knowledge as to its being easily drained and not too easily washed. In future chapters this subject will come up for careful discussion.

The highways of the United States are in a transition state, and they will not count so seriously in making the choice of a homestead after the reign of the automobile is well established. This new gasoline power belongs to the people after all — although the farmer has had something of a tussle at

the outset. It is going to make our whole farm property suburban and enable every village to communicate almost as readily with the market as those on railroad lines can do at present. It demands and is securing a revolution in road-making. In fact, it is going to boulevard the whole country.

At present, however, you must take into account the condition of the roadway very seriously when selecting your site. The difference between good roads and bad roads is at least one-third, often two-thirds, in hauling. Then, if you are to consider your personal comfort, there is hardly one thing that affects it more than the kind of road you are allowed to use. I have seen carriages dragged through mud up to the hubs, and the owners soon grew sick of country life. The art of road-making is not to be commanded out of hand by an ordinary pathmaster, but the control of our roads is so steadily passing over to State and county commissioners that the change for the better will assuredly go on much more rapidly.

Select a location where you will not suffer from primitive habits the moment you step off your property. There are sections, as in Florida, where roads are only trails under the pines, and this is a shady and convenient way of going cross-woods to neighbors or to market; but our Northern homes are reached only by straight lines and square corners, with fences on both sides —“ a right down wasteful way, suh ! ” says my negro plowman, “ and right hot, too, I reckon.”

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All of which means look out for shady roads, and do not buy where the people have squatted down without regard to comfort or beauty. Besides, the time may come when you wish to sell, and in that case a well-shaded home, reached by a well-shaded and well-kept avenue will double the market price of your property.

You will naturally look out for the schoolhouse and the church and the store and the depot and for the sort of neighbors you are to find. Children should not be compelled to go a very long distance to school, although town schools are now sweeping out the district schools. The old red schoolhouse is about done for, and I am glad of it; but where there is no public conveyance to the town graded school it is hard on the boys and girls if they are compelled to go more than a mile.

It is not improbable, however, that many of the new country home-makers will do, what I have done myself, employ tutors at home. Every country homestead has its own material at hand, and the children need but little guidance to make them fairly expert in half a dozen sciences. Nor will they get a good knowledge of country life and country work in any other way than by careful home training.

Country churches are now almost entirely deserted in many places, so here again comes in the question of how far are you willing to live from the village or the town church. This weekly gathering in the country is hardly a question of religious faith, but of



Photograph by Paul Thompson.

AN OLD HOUSE IS GOOD RAW MATERIAL FOR A REAL HOME

social life, and most people cannot afford to neglect it. Only those who have large libraries and peculiar facilities in the way of culture can get along without the weekly meeting. Even to this class there is a good deal lost.

As for neighbors they are a good deal what we make them, as a rule, yet after all there are neighborhoods where one would not like to cast in his lot. I advise you to know a little at least about this matter before you decide on your purchase.

A good brook is money and joy in one, and I think so much of a beautiful stream of water that I should count it a very important item in selecting a country home. It is half of life to children, turning their mimic water wheels, and it will come very handy to irrigate your strawberries and help you through a drought that threatens to destroy your garden. The talking of a brook will put a lot of poetry into your daily life, and I can easily imagine how the mother of the household will find a bend where she can place her easy chair, and, under a beech or an apple tree, let the rippling and the singing sweeten her thoughts and drive away care.

Then again the time is coming when every farmer who can command a bit of water power will have his own plant for electric lighting and a good deal of machine work. At any rate, he may carry it to his barns as water power, or to his house, to be used in case of fire, or possibly provide pure spring water for consumption. In any case, look about to see if

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there is a brook on hand. I have a bit of a stream running quietly through my apple cellar to prevent the shriveling of fruit; then it winds on to where I can use it among my berries.

Be very careful that you do not overlook your surroundings. At one time I was beset from the rear with ungoverned youngsters who made fruit growing something of a tax. I planted along the fences the roughest sort of blackberry bushes, until my Kitatinnies and Snyders constituted a sort of body guard and fruit guard that kept out all marauders. It is better, however, to know what you are to guard against and to find out also what sort of exposure you will have to wild animals. Wood chucks in the corn, weasels and skunks in the chicken yard, foxes occasionally, and hawks and owls overhead can make things very lively about a country home. It is just as well to avoid these fellows if you can, but fight them if you must.

I shall teach you by and by how to make a good rear, but it is better to buy one already made. Beauty of outlook is the poetry side of the country, but poetry is only the butter on our daily bread. We must look out for the bread as well. A vineyard of grapes that has cost us a good deal of money and labor ought not to be at the mercy of either birds or boys. We shall have enough to contend with along this line at the best; so I recommend you to know fairly well what you will have to do, before you begin.

Every country home ought not only to furnish its own fruits, vegetables, eggs, chickens, flowers, etc., but in some direction there should be a surplus for market — in other words, every country home, small or big, should pay its own way. This makes it very desirable that you locate not too far from city or town. It is true that I am advocating the building of homes in the country, but for the present we are not able to command the conditions of transportation. This will come about in due time, so that anyone may have his garden stuff fifty or one hundred miles from market, and reach the consumer early in the morning. At present the vegetable or fruit grower can drive, each morning, ten to fifteen miles and reach his customers in time — that is, before nine or ten o'clock. Most of his supplies will be in demand by that hour, and it will compel him to be a very early riser.

A little nearer the market will be better, but if you have private customers, which is always desirable, you must not live more than twenty miles from their residences. You understand, or you will learn as you go on, that a good deal of your fruit, such as berries, will not keep over until the second day. They must be picked one day and delivered the next morning.

If you cannot locate yourself as I am suggesting, you must look out for some sort of public conveyance. The trolley cars in some of our Western States are already drawing long lines of truck and fruit to

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market, in vehicles owned and loaded by the growers. We shall see more of this, and I am not sure but that the automobile will very soon become the country man's market wagon. I am assuming that nearly all country home-makers will soon have a surplus product of some sort to dispose of and that nearly all will need to find a convenient place of sale. I must not make this an absolute rule, for there will be a minority even in the country who will have no taste for gardening and orcharding.

How many acres does the country home-seeker require? That depends upon whether he is a skilled horticulturist or an amateur. I should say that he would require from five to twenty-five acres, according to his bias and what he expects to grow. I have only nine acres left, and half of that only is devoted to fruit growing. It is quite enough, looking at the amount of work to be done, but it is not enough when one has gone so far as to be carrying on experiments in cross-breeding. This requires the isolation of new products in the vegetable line, to prevent sporting and recrossing. In fact, I need at least twice as many acres as I have. However, you can get a lot of gardening done on five acres, or even on three; only by and by when you wish that you had ten you will find that your very success has run up the price of land about you, and you would have done better to have bought a little more at the outset.

A country home must in some sense always be a growing home, but do not start out with big ideas.

As some one has said: "Do not begin at the butt end, but at the wedge end." Begin on a small scale, and expand as conditions demand. Five acres will give you a garden and a house lawn and will feed a horse. Twenty acres will not only grow a good deal for market, but if wisely handled will feed a horse and two cows. Rightly managed, it will bring you in over one thousand dollars surplus, as soon as your gardens and orchards are in full bearing — it may turn over to you two thousand.

As to price, I can take you to a locality where the valuation of land is one thousand dollars per acre, while half a mile away it is one hundred dollars or less. The reasons are a combination of high improvement with splendid outlook, choice neighbors, and some of the other advantages which I have designated. You can get choice places generally for from twenty to seventy-five dollars an acre, but a great deal depends upon the surroundings and certain accidental conditions. In Florida I found excellent orange land selling at from ten to twenty dollars per acre, but this was owing to the fact that a great freeze destroyed millions of orange trees in 1895. Those same lands are now at double that valuation, and going up.

In most of our Northern States good sites for a country home can be purchased at from fifty to one hundred dollars per acre. The question must be settled by a thorough examination of the soil, relative locality as to railroad and market, and all the other

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items that I have specified. Whatever else you do, do not buy through unknown agents and do not take up with any of the splendid offers made by those who speculate in land.

I have made as clear as possible my own experience in selecting a place for a country home. I advise you not to be in a hurry, at all events. It will be a memorable feature of your experience to go on a long and rather still hunt. When you see what pleases you, go again, study it, and without enthusiasm. Remember violets grow in more than one dell, and that old apple trees are to be found on more than one hillside. Burn up advertising circulars and do not attend any auction sales — even where there are free rides and free lunches.

Run no danger of getting roped in to an inconsiderate purchase. You cannot quite trust yourself, and in this matter an unwise purchase cannot be easily reconsidered. I have persistent and continual pressure to buy land in Florida for those who have never seen that State. I refuse to do this unless the conditions are very peculiar. Go yourself and look over land and study conditions, so that first of all you may know whether you can adjust yourself to the conditions that you find involved in the purchase.

Of course, some of us cannot have the first pick, but if you can overlook a beautiful valley you as good as own it. Your property is not measured exactly by what your deed covers, and this goes a long way farther in the country than in the city. I travel

about Massachusetts and New York, and almost everywhere come upon spots so beautiful, so homeful, that I long to purchase and develop each one of them. Somebody will do it yet, and America is bound to be one great garden, while our highways constitute a public garden for the benefit of all of us.

Meanwhile, if your lot is not too closely conditioned, take up one of these noble bits of property. Do not trifle with it, but what you do should be done with the one controlling purpose of forever enjoying that landscape.

"Well," said a wise and witty Irishman who brought me a load of hay, "if I could forever see that valley, sir, full of villages and orchards, I'd not ask Peter to use his keys for me. That village in front sits on the middle of the valley, like a diamond sits in a queen's ring."

The scene had awakened all the poetry that sleeps in the Celtic mind. That is the value of a home in the country; not merely to feed the body, but also to feed the soul.

The conditions, however, are so various that everyone cannot select from the standpoint of landscape and outlook. The teamster will do wisely who looks to proximity to his work and fertility of the soil as the two sure requisites. He wants enough land to feed his horse or horses and to furnish garden room.

"Well, sir," said a heady fellow, "I'd like it out here on these hilly slopes, only you see I must be at my work in the city by seven in the morning, and I

may be needed until eight o'clock at night. I've a pretty acre, just half a mile from the city lamps, and there I've as fine a garden as one may wish. I'd be glad to have you taste our asparagus, and later our string beans and fresh corn. There's a small bed of strawberries, too, and along the fence some raspberries — not many, but enough for us and a few for my friends.

"I get three cuts of alfalfa from my yard and from the lot in the rear, and it nigh feeds my horse. There are three pear trees for shade, half a dozen plum trees, and a lot of cherry trees besides, in the garden. The wife tends all these, as well as her hens, and it's not seldom that she gives me a basket of eggs for the market. Since we began to earn and to save, and to sleep well, I drink less, and there is a bank account slowly creeping on.

"The children are out of the streets, with a chance to be helpful in the garden. They have as much fruit as they like, and flowers in the bargain. I like nothing better myself than to sit on the turf with them, unless it be to see how clean and healthy they be growing."

I know two maiden ladies — old maids if you please (for they were growing old very fast) — who came out of the city about eight years ago, and bought a cottage half a mile from me. They were very poky and full of ailments. They planted flowers and lettuce, and soon had their own pie plant and greens and fresh peas and a good deal else to

live for. They kept bees and grew enthusiastic over their pets. They are now rosy and full of old-girlishness.

Horace Mann said that the world could not get on without a quota of old maids. Certainly this sort of sun-kissed women are invaluable in any neighborhood. It was the country, however, that made them, and it was the getting back to Nature that awakened and refreshed their souls.

As things are now, women can run a country home nearly as well as men. They have not only the garden and the bees and the hens, but they can manage the small fruits with ease. I know one Ohio girl who has taken to quince growing, and if you want to see something beautiful walk through her rows of Angiers and Meech and Pineapple quinces. You will easily find in Missouri and Arkansas a goose girl — that is, a girl or woman who runs a goose farm — and she makes money at it to a certainty. It is a novel sight to see a long drove of geese going to market, shooed along by their owners.

The ordinary clerk is, in my judgment, the least fortunate of all men, because he is being spoiled for home-making. He is kept in an intellectual treadmill until he has got beyond the power of growth and expansion. Look out for this, my friend, for it may come before you are thirty years of age. However, if the clerk will break loose from conventionalism, especially from the boarding house; will marry a wife and buy a place out near the trolley,

his chances mend. He should not be very far from a quick transit, for he is liable to oversleep or lose a few minutes from his dinner hour.

Here he can have his garden and a few fruit trees and such associations with Nature as will keep him alert. He should discover the morning and see the sun rise every day of the summer. I said to one of this sort the other day that I believed one hour of the morning was worth three or four of any other time of day, and that daybreak was the most delightful of all times.

"So they tell me," he coolly responded. This sort of chap, who at forty has never seen the sunrise, certainly not since his childhood, has no place in the country. Yet I should like very much to encourage the clerks of our big towns to an ambition outside of a counter-bound and enfeebling effort to sell a corset or a line of toweling. Why not grow cabbages like the Emperor Diocletian?

Ministers I sympathize with — am one myself — and I see no reason why a minister should lose his vitality and become a dried-up parson, unfit for the pulpit, at sixty. If he will live close to Nature, he may be young at eighty and more virile than at forty. We have heard a good deal about old age, but nobody yet has told us what it is. I am inclined to think it is a mere habit that people have fallen into and are not yet quite ready to shake it off.

Our professional men may have country homes quite as well as our day laborers and merchants, pro-

vided they do not go out of call. The doctor, with his telephone and automobile, can live one mile farther from his patients without injury, and as for pastoral calls, most of them had better be made over the wires. The minister can do no better thing than invite his hearers to a walk and a talk in the gardens and fields — as his Master did.

If you buy an old or deserted homestead, consider the reason for its being on the market. Is it wind-swept? Was the soil exhausted by bad cultivation? Or, on the other hand, are there some fine old orchard trees that can be rehabilitated? Can the buildings be renovated for use, at least temporarily? Are there great masses of manure and fertilizers of other sorts that can be immediately put to use? Are there shrubs and plants and plum trees and cherry trees out of which one may begin a small fruit garden?

Very frequently around these old places, which look very rubbishy, you will find quite a mine of wealth. In fact, you may set this down as a certainty, that the oldest and most neglected of these deserted farms are very far from being worn out or poverty stricken. The owners did not know what they held, or in some way were not up to date in land tillage. Connecticut is now growing five bushels of wheat to the acre more than Minnesota. I have known a man to live for twenty years over a marl bed and not know it. The new farming is the find-out farming, and it is putting new valuations everywhere.

Other things being somewhere near equal, buy

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your own old homestead if you can. These deserted places are being picked up quite too much by strangers and mutilated with all sorts of improvements. I would rather have a few old apple trees, put in good order, of course; just the trees that I climbed in my childhood, Spitzenburg and Rhode Island Greenings, some of them leaning down so that a child may creep up and hide with the robins among the apples.

I would rather have these old trees than all the avenues, automobile driven, that are planted around Long Island Sound by millionaires. The sentimental side of life pays. In England families count; here it is only the individual. The boy is pushed out of the homestead at twenty to start a new home, and so nothing is ever finished. Learn to let the family spirit live in all that you do.

You may possibly be able to do as I have done, after forming a partnership with your own sons, go with the birds North and South and have a home at each end of the route. In Florida we escape the rigor of a Northern winter, and with the robins we flit Northward when the daffodils blossom and the maple sap runs. A Christmas bath in Lake Lucy, an arm full of roses on New Year's day, and oranges all through January, these things fit well to peace of mind and long life.

CHAPTER II

FIRST STEPS TOWARD THE HOME

WHEN you have found a piece of ground that you have thoroughly considered, both as to itself and its relations to its surroundings, a property that you can look at lovingly and say it is your own, you must learn to make the best of it. Be sure you do not fall into the common blunder of imagining you have only to hire a builder to construct a house into which you will move, supposing you are living in the country. If your house is a city house, and your surroundings are citified, it will be a problem whether you are living in the country or the city.

One who lives a real life in the country does very little of it indoors. For this reason he must look out carefully for his out of doors and see to it that his gardens, lawns, groves, orchards, retreats, and drives are his own, and expressive of his own aspiration and character. The most important part of country home-making precedes the house. In fact, you cannot wisely build at all until you have done some planting.

I have seen a house put up on a knoll, conspicuously, without a tree to shade it, and it was as pleasant to

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live in as a Dutch oven, in no way as attractive as a common city home — for in the city one house shades another. I have just now in sight a country house where the owner began with grading and tree-cutting. He sheared off every knoll and filled all the hollows, and then built a house. It will be at least ten years before he can give himself a country environment.

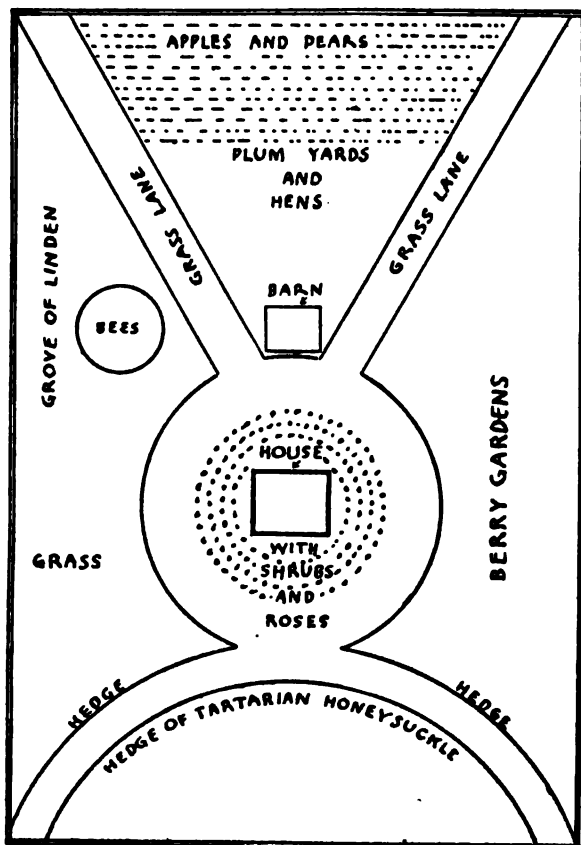
This grading business is dangerous altogether and should be undertaken only after a good deal of consideration. As a rule, the rolls and swales and hollows are Nature's idea of grace and beauty. She fills the hollows with mint and ferns and forget-me-nots, and over the rolls she scatters her grasses and clovers. What one has to do is to sit down on the highest point of his land, at the very outset, and try to understand what Nature has been doing.

Get as nearly as possible the full relation of your land to the rest of the land about. Sit there until you can feel with Nature, catch her idea and the sentiment of your homestead. Be sure it is part of a poem. It might be well to wait a few days and take another survey, and then a third with your wife and children.

As soon as you have begun to grade and level down, you are liable to throw your property out of relationship to its surroundings. I can show you a hillside, where the first homesteader, instead of leveling his house to the land, leveled the land to his house; this made no end of work for himself, for the showers came guttering down and filling up his hol-

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lows; and then every man who followed him in building did the same thing, digging flat places into the hillside, until the whole hill was sliced and carved out



From Two to Five Acres; Have Everything Convenient and Waste no Time Getting About.

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of comeliness. It was a small attempt to make a side hill look like a plain, and such efforts will always fail.

After you have made a thorough study of what you have purchased, you are ready to plot it on paper. I advise you to do this work yourself. A landscape gardener is likely to express an ambition and set you to working that out. He will almost surely undertake too much. After you have completed your work, you might allow him to look it over and make suggestions, but the real plotting should be between you and Nature. I am talking to those who are going into the country with capital enough to command a small homestead and work out their own ideas.

The teamster and the clerk, as a rule, must content themselves with properties already plotted and near the city. But even these can find many ways for expressing themselves in their new homes. This can be done in the garden with flowers, and in a hundred little byways and hedges. I could show you a two-acre plot, level as your kitchen floor, but unique at every point, and expressive of the character that made it. I have helped a good many at this landscape work, but I always refuse to do it for them.

The first thing to plant is yourself, working into the ground your own views and opinions and even notions, as well as tastes. If you have a good piece of property it has lots of expressive features. Do not stop studying it until you have found out all that can be done. We understand that your conceptions

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are put on paper at once, and these are to be viewed and reviewed and amended until you are fairly satisfied.

You have no idea how much pleasure you will get out of these preliminaries. It is a mistake to say that you do not understand landscape work. Professionally you do not, but you are learning a good deal about such things every day, not only about the surface and the roll of the land, but about the soil and its needs.

In my chapter on "Finding the Home," I told you that I had known a man to live over a marl bed without finding it out. I saw a surveyor trace a fine vein of iron ore right through a dozen farms, not more than three feet from the surface in places, and not one of the farmers had ever suspected its existence. On the other hand I visited a man who had a beautiful brook running through his pasture, and his neighbor's sheep drank from it after it had left his own pasture, but not until he had harnessed it to light his house and run his machinery. It depends a good deal upon eyes and ears and how you use them. Ten acres that you do not read are like ten books in Chinese on your library table. All this while, you understand that you are not to try to repeat what somebody else has done, but to work out your own problem in terms of the beautiful and the useful.

This charting and plotting of your property does not mean a complicated piece of artistic drawing, but

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a very simple outline sketch that you can understand yourself, even if no one else would pronounce it beautiful. Anyone who undertakes to live in the country must first of all learn to see things, and this chart of yours tells what you see, not only now visible, but as hereafter possible. If you have only a little bit of vision power, cultivate it.

Look over your new property, and before you do anything whatever think what might be done. Leave out all artistic sketches and just study how you and yours can fit nicely into what Nature has already done, and how you can improve, without undoing or spoiling what has gone before. Depend on one thing, that when you begin to contradict Nature and plow her out of her fields you will have a long job of it.

This paper chart from which you are to do your work you can easily see is extremely important, because it can be mended and amended, but if you begin directly on the soil, striking in anywhere, you will at once be doing something that cannot easily be rectified.

Right after the plotting of your property, in fact while you are still carrying on your study you may undertake the drainage problem. I am quite sure that, however soon you initiate this ditching business, you will not get to the bottom of it for several years. I have seen very contented country home-makers laying out what is called the Waring system all over their acres. I have found that the adoption of this

system or any other patent system will not end the difficulties.

If you live on a side hill it will take you many months, if not years, to discover just how to catch swift showers most promptly and carry them away so easily as not to be erosive of the soil. My chief difficulty at this point was that I lost constantly a good deal of my best property, carried downhill into my neighbors' fields and into the valley. Drainage does not mean simply to prevent the settling of water in swampy spots, but the ready catching of spring thaws and cloudbursts, at the same time taking drainage from the house and the outhouses to some safe receptacle. The Waring system will carry away and distribute fertilizing material, provided it also has an outlet in vegetation, but to fill your acres full of poisonous drainage demands that it shall be taken up by the foliage readily, or it will poison the air.

I prefer tile drains that will carry the house waste a safe distance and discharge it directly into compost piles. These compost piles we shall talk about more hereafter, but for the present understand that they are to be made of barnyard manure, road waste, all the coal ashes you can accumulate, autumn leaves in great abundance, together with weeds and all the rest of the refuse that is thrown into the street, or allowed to dry up in the fields. I assure you that there is a vast amount of this sort of stuff that goes to waste and that it is as important a product as anything your acres can yield. Piled up and allowed to

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decompose slowly, these compost heaps become the chief resource for keeping your land fertile, your trees healthy, and your garden stuff abundant.

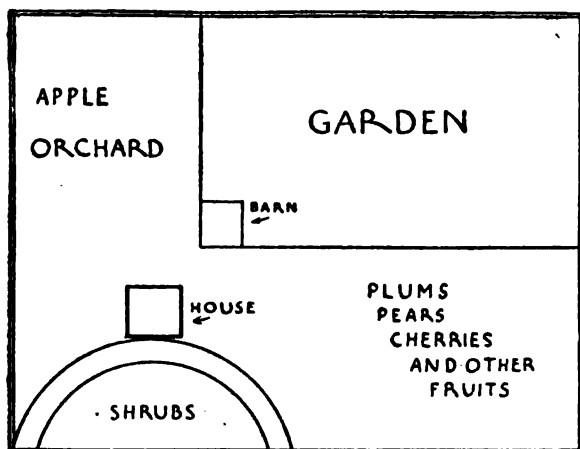
Tile drains are always preferable to stone drains, but they are often less economical in the long run. If your land is stony you may use a large quantity of stones in drains, always making sure that these drains are large enough and that there are enough of them to carry off the heaviest flushing of April weather and the dashing of a summer shower. If your soil is full of springs, as it is likely to be, tile drains will be needed every twenty-five feet. Plant them at least three feet deep and make sure that you know just where they run, for you will need occasionally to open them for repairs. I have had more or less trouble in finding my ditches, especially when they run through berry yards.

If you have followed my advice about grading and leveling and have only removed roughnesses you will find that you cannot run all your ditches in one direction. They will have to be gathered into mains, that is, larger pipes, which will carry the wash either into neighborhood drains or into the highway ditch. The house drainage that runs into a compost pile should not be of a character to wash out the fertilizing material, but rather to deposit what it brings.

Let me tell you that these compost piles will not be an annoyance, either to the eyes or the nose, for we shall cover them all summer with squash vines or pumpkin vines, while Nature slowly decomposes the

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material, and fits it for the land. For that matter my compost piles have always proved an attraction to visitors, as well as an object lesson in economy. Everyone wishes to know what they are, and I make them a text for a horticultural sermon about wasting plant food. Manure, as a rule, as applied commonly,



The Minister's Retreat is all Garden and Fruit; Good Sermons Grow Along With Parsnips and Cabbages.

loses nearly ninety per cent of its values, but a well-constructed compost pile loses not to exceed five per cent. A dozen big Hubbard squashes is the first crop, and I have dug out of such a pile sweet potatoes as large as your head.

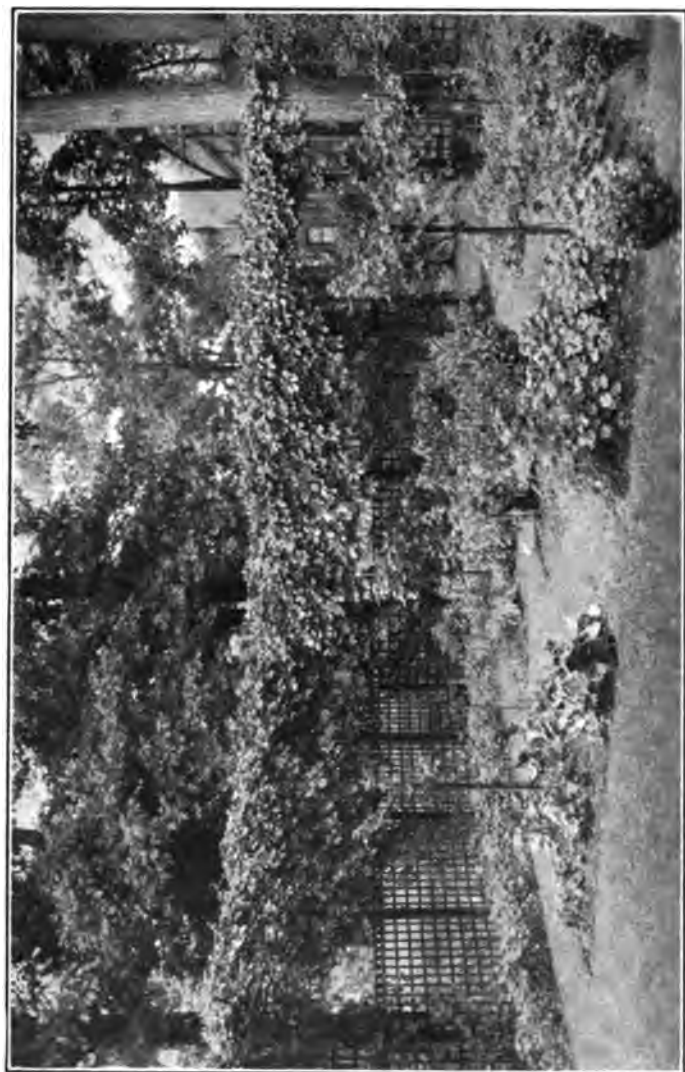
Our next point in a preliminary way is laying out drives. These have for their main purpose inter-

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communication between the house, the road, and the barn, but a properly laid out country homestead provides for drives and paths that reach every part of the grounds. Some of these may be grassy lanes, that lead about among the berry gardens and through the orchards. I do not hold that this is a waste of land. It saves the dragging of wagons through the mud, or the cutting of ruts in the turf and the inconvenience of carrying crates of berries and barrels of apples a long distance by hand. In other words, make the approach to every corner and every quarter of your land as easy as possible and do it in the most natural way.

While cultivating your berry orchards you need a turning place at each end of your furrow, and this should be in such lanes as I have suggested; in all cases these should be expressions of the beautiful as well as the useful. The drives to and around your house should avoid straight lines and stiffness as a rule. Something is gained generally by starting at the corner of your lot, instead of directly in front of your doorway.

This does not mean, however, that in a quite small place it is necessary to curve the walks or drives from the street to the house. I think the teamster who has only one or two acres will show much better taste by economizing his land and growing more alfalfa. One good broad driveway, bordered by a tidy path, and all of this hemmed in in the old-fashioned way by lines of shrubbery, will serve him well — and will be



Photograph by Alice M. Kellogg.

TRELLISES COST LITTLE AND MAKE BEAUTIFUL GARDEN FENCES

in the best taste. Along with this shrubbery the housewife will probably find room for her pinks and asters. Where the distance is greater and the property larger, let the walk or drive follow Nature's suggestion around a knoll or down a swale and sometimes inclose a group of trees.

Remedying a defective driveway, I suggested to a planter to leave a row of trees directly down the middle of it. In the middle of one of my own drives stands a superb Kentucky coffee tree. The most beautiful highway that I have ever seen in New York State passes through a grove of elms and maples. It was on no account necessary or desirable to cut any of these.

You will almost surely find that Nature has some suggestion for you at every point and has made many preliminary arrangements; it is quite the thing for you to accept her advice. What I have said should not, however, be misunderstood as suggesting the cutting up of every piece of property with formal walks, or drives, everywhere. We can do most of our walking on the turf, and as a rule our arbors and retreats need to be out of the way of visitors. The width of a drive should be generous, and where used for both walk and drive it should not be less than sixteen feet.

If bordered with hedges, remember that these will increase their width one inch a year, even with close pruning. That is, one inch on each side of the drive will be deducted annually, which is one foot

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every six years. You see you are losing your driveway steadily, so that in thirty years five feet of it (two feet and a half on each side) will have been absorbed by the hedge. This requires foresight in planting, as does every other step that you take in creating a country home.

The advisability of bordering your drives with hedges depends upon the lay of your land. The first object of a hedge is not the beauty of the thing in itself so much as the break that it makes in a smooth landscape. We shall discuss this more hereafter, and for that matter the hedge planting can easily be deferred until after the house is built. If you plant hedges at all, at present, confine yourself to Tartarian honeysuckles, among the shrubs, which are very easily replaced and transplanted.

While laying out my Clinton homestead, having placed my house far back from the street, I found that road-making was the one most essential feature in my preliminary work. My neighbor caustically suggested that I was laying out a railroad. Bordered with arbor vitæ these drives now constitute a most attractive feature of the home. They demanded a thorough study of swales and slopes and natural approaches. They were then thoroughly drained, with tile placed at the sides and the roadbed made of furnace slag, covered by red shale. This shale first melts under the effect of showers and then compacts until it is a solid and nearly imperishable roadbed.

Cutting may be another part of your preparatory work, only whatever you do of this sort do very slowly and deliberately. Possibly you have bought an old homestead with trees already on it. These, having probably been neglected for many years, will need judicious trimming, and no doubt some of them will have to be cut out. Walk around a tree thoughtfully half a dozen times, on half a dozen successive days, before you use ax or saw. Study each tree individually and in its relations to its neighbors, and then cut conservatively. You can destroy the work of fifty years in a single day, but you cannot restore what you have removed. Trees are the work of time and are not to be dealt with lightly.

Do not let a professional trimmer get at the work. He is almost sure to be a hireling, whose interest is to cut as long as he is paid for it. When I think of cutting a tree I examine it from every point of view and aim to comprehend its relations to other trees and to the outlook. Then I go when I am in a different mood and at a different time of day. There is lots of character in some of these old orchards and groves, and we must not haggle them into modern conventionalism. One huge old apple tree or a giant elm hanging its limbs over your house is sacred property, and a row of ancient butternuts is as full of history and poetry as it is full of nuts. Be careful also when it comes to trimming or grafting; these will be necessary, but cut with conscience and tenderness. The old Saxon word for thorough

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was through and through. Do your trimming with thoroughness — that is thoughtfulness.

Even more important is our planting, for before we build our house there should be a good deal of this done, and where old places have not been bought, it is all important to get ready for shade and shelter at the very earliest moment. I like the suggestion of a friend who owns a dozen acres and held them for seven years before building.

He said: "Why should I go out there to live before things are ready? Why suffer from the heat, and very likely from malaria, when I can just as well get trees and vines ready for shade, at the same time that I am getting rid of pools and marshy spots?"

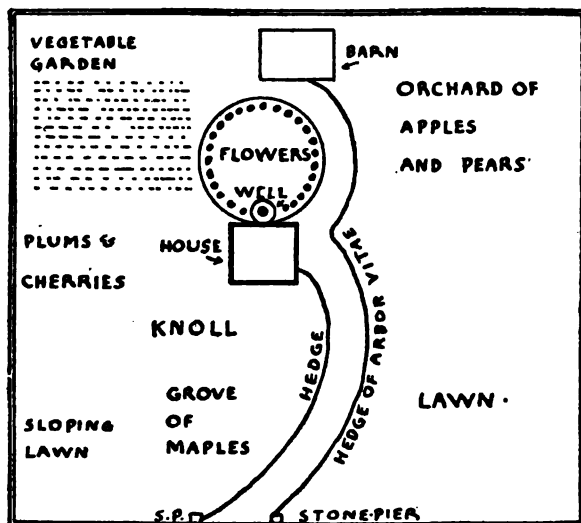
He had patience and good sense, planting a grove of lindens, which he said would be ready for his bees and a Norway maple which makes a grove all by itself and a group of hard maple, out of which he intended to get his supply of sugar, and a few such friendly trees as butternuts and beeches. Beside these he had started rapid-growing grapevines which could be trained to his verandas at the earliest possible moment.

Select those trees that grow with rapidity, for it will make a difference of four or five years in the matter of shade. One of the best of our thoroughly hardy trees is the *catalpa speciosa*, but if I were planting a very small homestead I would take instead the small-growing hybrid catalpas, originated by Mr. E. Y. Teas. These are gorgeous in bloom, rich in foli-

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age, and seldom get to be more than twenty feet high.

A grove of basswood started as a preliminary is also just the thing for your bee quarters. It makes a capital shade in a very short time. You cannot be-



A Country Home of From Five to Ten Acres—or More. This Will Allow for Diversity as Well as More Privacy.

gin too quickly to supply food for these busy little helpers. The common locust and the so-called honey locust, or gleditschia, are also first-class bee-feeders, and very rapid growers for making shade. I like these rich flowering trees that give an abund-

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ance of sweet odors (that is, ozone). They are wholesome as well as delightful.

I do not like to anticipate a coming chapter on trees and orchards, but I am inclined to think that before I began to build my house I should plant an orchard, at least a few apple trees, for it will take six or seven years to get them into bearing. I am not quite so sure about a preliminary garden of strawberries and raspberries, but these need not occupy the place that will be ultimately assigned to them; only for the present let them be convenient to where the kitchen door will open. In other words, you do not want to go into a country house and wait two or three years for a dish of raspberries of your own growing or a bunch of roses, and you do not need to wait eight or ten years for a basket of Northern spys from your orchard.

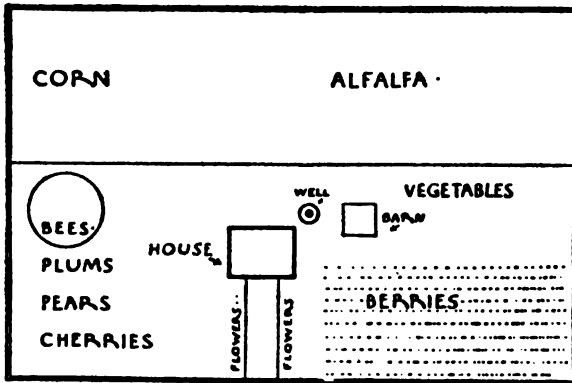
Pear trees yield their fruit very quickly, and so do plums. I have noticed that if none of this preliminary planting goes on, it is likely to be put off for some time after the house is built. It is a disagreeable sight, that of a country house staring white on a hillside, without a tree to shade it or a vine to climb over it for years.

Now listen to my advice and be sure to follow it at this point if at no other. Do not add yourself to those foolish ones who build a house before they drive a well or build a capacious cistern. Drive the well before, not after, your house is begun. Let it go down deep into rock, so deep that it will insure

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you an unfailing supply of water that cannot be tainted by surface drainage, or in any way affected by the most droughty season.

I have found that, as a general rule in New York State, we are through with soil and rubble after driving thirty feet. At that point we strike rock of some sort, and from there we should go at least thirty feet farther before withdrawing the drill. Of



A Suburban Plan, Where the Lots are Not More Than an Acre or Half an Acre; no Front Yard is Needed, Only a Clean Street in Front.

course it is the interest of the driller to conceal from you the first pockets of water that he strikes, and he may even shut them out, that is drive his pipe through a good supply of water into the rock. It is essential that you watch the work, and insist on a thorough test at every stage of the work, after the first fifty feet.

My experience tells me that after the drill has gone down one hundred and fifty feet, water is not likely to be found until you have gone a good deal below that. Somewhere between fifty and one hundred and twenty feet you should find water, and the whole cost of the well, including pipes and pump, should not exceed from \$125 to \$200. I found abundant water in Florida at sixty-five feet, thirty of it in the rock, which almost exactly tallied with the work done at my Clinton home, in New York — thirty feet in the solid rock, reaching abundance of excellent water. My Clinton well has the additional advantage of flowing. This can very rarely be secured.

The cost will be absolutely nothing compared with the discomfort and loss of being without a pure water supply for your family, your cattle, and your plants. You can do nothing safely in the way of planting a tree or shrub unless you can puddle the roots and keep it well supplied with water when planted, and for some weeks after. Cisterns should go in with the house and they should not be stinted in size. Each one should hold at least fifty barrels; one hundred barrels would be better. Built of brick and well cemented, a cistern will last nearly as long as the house. In some sections it is desirable to have double cisterns; that is, a brick wall through the middle, through which the water for drinking will filter. That is, the water is caught in one cistern, and filtered through into the other.

I am sure that one-half of all the sickness in the country comes from the use of surface water, taken from shallow wells or tainted streams, and yet not one-half of our country homes are decently supplied with wells — perhaps more of them with cisterns. I asked a physician of very high standing to what he attributed most of the ailments with which he had to deal. His answer was: "First, bad water; second, bad habits. Nearly all sickness is preventable, but above all things be careful what you drink, and then how much and what you eat."

Much more attention is being paid to wind-breaks and hedges, and I have already suggested in my last chapter how very important I think it is to look out for these defences. A stout wind-break against northwest winds, or wherever your sweeping storms come from, will modify climate materially. It will make a difference of at least two degrees from one side of the road to the other, and with this difference in temperature must be counted in the sweeping winds that carry the moisture off your land and dry up your foliage.

Everybody knows the advantage of getting down under the protecting slope of a hill. The wind leaps over you, and you find that in the middle of the valley it is rougher and colder than at your protected home. A planted wind-break is, however, the best that we can secure or construct over large reaches of our country. For quick growth and excellent service the best material will be found in those ever-

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green trees that are native to your section. In New York State the hemlock and the spruce are especially good, and in New England the white pine is one of Nature's preferred defences.

In the Western States the Lombardy poplar has been freely used, and of late the Carolina poplar. These trees are brittle and soon go ragged, but still worse is the root growth, which extends forty to fifty feet from the trees, greatly hindering cultivation and the growth of turf. Both of these trees are now excluded from our best-ordered cities because they destroy the pavement. I should prefer the evergreens and after them the white and black ash and the American linden. The linden is particularly good because it can heal over a breakage or wound very rapidly.

In a yard or lawn the mountain ash makes a good row, and if faced with stout shrubbery, such as lilacs and viburnum opulus and Tartarian honeysuckle, breaks the wind admirably. Some of the fruits will do you good service, especially the pears. The Buffum pear in particular, growing upright as a Lombardy poplar, makes a stout hedgerow, besides giving a large supply of very fair fruit.

I should not think of building a house or in any way establishing myself in the country without inviting the birds to come with me. They are allies that must be won for success, and the quicker this is done the better. Unless your home is made generous and agreeable to the birds you will be whipped

by the insects, and right soon. These feathered friends will have to be fed, and the quicker you begin to provide for them the quicker they will put in their work for you. Let it be understood at once that your acres are to be free from dangers and alarms. In fact, I think you would do well to put up your bird houses before you put up your own.

Plant a grove of basswoods to give food to your bees and wild cherries with mountain ash and bush honeysuckles to make sure that the birds are never out of food. Then banish guns, except to destroy common foes. Birds are very sensitive to the beautiful and quick to appreciate safe retreats. I am sometimes ashamed to note the ease and grace with which they construct their country homes — the common sense and bird piety which they manifest while training a family.

At this rate you say we shall never get a country house built at all. Well, what I wish to emphasize is that to build a house is a very insignificant part of home-making in the country. What you are after is life — full, true, happy, long life under the best conditions for rational development, and that does not consist in building for yourself a huge box of a house in which you will do a lot of house cleaning and a lot more around it of planting and digging. If you cannot find help and moral uplook and a big measure of poetry, with keener eyes and quicker ears, and a growing sympathy with Nature, you might better stay in the crowd.

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All these preliminaries which we are discussing involve education and they will accumulate common sense. A man may live in the country half a hundred years and be insipid in all his thoughts, and stupid in his work. Nothing is lost in time by these preliminaries. All this work will have to be done, and what I am after is to see it is done in time, while it can be done best.

I greatly dislike to go into a country house and find them drinking lake or river water, and washing at a pond some rods from the house, and in winter with snow that has been thawed over the stove. I dislike to see all the trees in an orchard growing at a slant, for lack of wind-breaks. The only drives that you can find associated with half our country homes are mere ruts through the turf, running from the street to the back door and then to the barn. The owners consider it a waste of time to construct a good private road. Just as limited is the supply of shade trees—generally confined to a few old apple trees and a single diseased maple or possibly an elm here and there.

However, we are about through with our preliminary talk and only care to reinforce it with a point already touched upon, that is unity. Perhaps I have implied in what I have said about charting before planting that all these preliminaries must work together and create a simple unity, a single home idea; all the parts must fit to each other. And this is the sum of the whole story. You must digest

your planning so that you yourself see not a pretty thing here and something else there that is agreeable, but a fellowship of all fine things, coöperating to create your home.

You will notice, if you consider, as you drive by most of our country homes, that there is no such community of purpose. The houses have been dropped down in a conventional way and about the same distance from the street; then when the owners get hold of a tree or a bush they stick it in anywhere, wherever there is room; the flowers are planted just where the lawn ought to be; until in the course of a few years the place is a mere jumble of good and bad things, without the least relation to each other. Every man's property should be thought out, and that means a thought-full affair. Go over your plan on paper repeatedly, until you are satisfied that everything is placed thoughtfully; then every planting will be done reasonably.

CHAPTER III

BUILDING THE HOUSE

WHEN we are at last ready to build a country house, we must understand that we have a good while ago begun to build a home. The house is not to be the central thought in this homestead of ours. It will be a convenience rather, and we shall do our receiving of friends as often under the apple trees, or where we can share with them the babbling of the brook and the fragrance of the roses. We mean to enjoy this country place of ours from gateway to wind-break, and all our planting and building will have in it this understanding, that we are not to repeat the restrictions and conventionalisms of city life out here in the country. I assure you that this has been a serious trouble with country home-making, but then it is hardly country at all, or country things, or country atmosphere that fills our minds.

The average country house is a misnomer. The builder gets his model from the city avenue. He has not studied the house from the country standpoint. A house in the city is related only to streets and to other houses, but the country house ought to be mainly related to the landscape, the orchards, the

gardens, and the outlook. The land-owner should live all over his land, getting his life as well as his living in the garden and orchard. This does not mean that architecture is out of place in the country; only that it ought to be country architecture.

As a rule, the man to plan a house is the man who is to live in it, and it should express first of all his feelings, and be very much what a shell is to a crustacean — only it need not be carried about on his back. Have you ever noted how the useful and the beautiful blend in one of these sea houses, the shell telling you what the occupant really thinks and likes? Our houses do nothing of that sort, or very seldom do it.

The country is spotted all over with houses, for the most part uniform, or very slightly varying a few conventional features; and they are set back just about an even distance from the road. Fortunately it is not possible for them to be planted near enough to quite create a row. The poorer ones are the prettier, because they really express poor folks' needs, and the nicest room is the kitchen, because it tells more about the people who use it. A parlor or a sitting room is generally pretentious and a flat failure every way.

Just note how people look and act in one of these formalities. The best place to receive visitors is on your veranda in big rocking-chairs or rustic seats, and as for your friends, take them to rustic seats and hammocks under your trees. The poorest house in

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the land can afford a good, broad, hearty veranda, — ten feet deep, and breasting at least two sides of the house — only I am going to talk about this more fully very soon.

When we come to the better sort of country houses, they lack independence; have no character of their own; are patched up of notions that have developed mainly in the crowd. The old-fashioned New England house was borrowed of old England and it never got over a foreign aspect. It would have been a good deal better if these Puritan Fathers of ours had imitated the Indians. Then about 1850 there came in a touch of scholarship, in the way of Greek porticos and big pillars, supposed to be Doric and Ionic. What in the world had we Yankee pioneers, shoving our way through the wilderness, to do with Greek temples?

These borrowed houses were not usable by their tenants. The parlor was shut up most of the time, until the Family Bible and hair-cloth sofa were equally musty. The verandas or porches were just big enough to be uncomfortable and practically useless. Soon after observatories were built on the roofs, but who had time to go up there to look out? Nobody did go but spiders and flies. Meanwhile architecture underwent another change and out on the hillsides we began to build copies of city houses in brick; and these were put up as conspicuously as possible, for people to look at when they ought to

have been looking at the trees and listening to the birds.

We drove about admiring these pretentious buildings and forgot the country altogether; did not hear the language of the brooks, until the country became a synonym for isolated stupidity. The farmer became Old Hayseed, and all around the cities rich people filled the suburban space with costly mansions. These mansions were surrounded with straight brick walls and a precision that trimmed hens and rabbits along the tops of the hedgerows.

What we need first of all is to know what we want a house for, and then the sort of a house that fits where we intend to build. There really is such a thing as a natural house, just as there is a natural tree, and the one ought to grow just as naturally as the other and as exactly suited to its place. Our first axiom is that a real country house belongs only in one spot, and to that spot it belongs naturally. In other words no other house could have wisely been built in the place of the one we have constructed. The architect who plans the same sort of a house for divers locations does not know his business.

We have gone into the country to see, to feel, and to know Nature. We have, least of all, any interest in a house that shuts out from us nearly all the beautiful that is within reach of vision and leaves us to enjoy wall paper and furniture. The result of the wrong method has been a very natural one, that the

country housewife's mind gets to be of the wall-paper sort, rather than of the landscape sort — artificial and conventional. Not living with the birds, she comes easily to the monstrous crime of wearing of winged allies for personal adornment. Study the place where you propose to build until you know exactly all there is around you that you can gather in a home (gather with your eyes and your ears), then plan your house to let this in and not to shut it out.

There should be not only wide verandas, but balconies and windows that are bayed to the light — never for ornament or show, but always for use. A sun-bath window to the east and a sunset window to take in the glow of evening to the west are natural. Let in the first rays of the vital morning and gather to yourselves the mellow sweep of gold at evening. Our relation to the sun's rays is hardly appreciated. We feed by absorption as well as by digestion. It is a good thing to let the sunlight touch us all over as often as possible; by no means shut it out of the house. Associate yourself with the light.

Your best property in this world is not your meadows and your pastures, your cornfields and your orchards, but that property of yours which is much farther away, in the valleys, or even in the skies. Nothing is more absurd than a few windows slashed into a house anywhere and looking nowhere in particular, and even these shrouded with dust-collecting curtains. Glass is not half enough used in our houses. The whole east front of many a country



Photograph by Jessie Tarbur Beale.

ROUGH STONE AND A LITTLE SKILL WILL WORK WONDERS

house might be mostly glass, or that front which can let in most of the glory of the world and the sky.

Then your narrow six-foot or seven-foot veranda is a meaningless as well as a useless adjunct. It is just big enough to pinch you, and not large enough to give you comfort. A country house should have ten or twelve foot verandas, on at least two of its sides, or all around it, and here should be everything to suggest comfort and companionship — not only hammocks and easy chairs, but hammock beds, that by day can be drawn up under the roof.

We start in with this fixed conviction, that in the country we are to live mostly among our trees and flowers, and that, apart from a few forms of toil, the house is to be used only when we need to get out of the rain or the snow. If you cannot agree with me on this point you may as well lay aside this book altogether. We do not need to be under cover most of the time. God made us to be as free as the other creatures. The sky is roof enough, except in a storm.

The best chairs are mossy logs and the brown lichen turfs. Our sweetest canaries are in the bushes, or freely hopping about the apple boughs. Live out of doors for beauty if for nothing else, for it will paint your cheeks, while indoors will make them pallid; for health, also, and for long life drink oxygen. Learn to walk, not merely when you must, but to enjoy it. Get into argument with the folks that live in the glens and exchange calls with the birds

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at their houses. Humanize everything about you, and be yourself humanized in turn.

Your house should, on general principles, be located as near the center of your property as possible. Even if you have five or ten acres, you may go well back into the land and select your site where you can command the scenery most freely and reach every part of your lot with the least waste of time and travel. If it seems to be too remote from the street, causing a good deal of travel when you go to the village or to a neighbor, remember how much travel is caused when you go to your fields from a house built on one side of the land. I do not say get exactly in the middle, but on some commanding position well back from the street.

This should be done, if for no other reason, to avoid that conventionality which repeats what has been done by our neighbors. But we would do it also to escape the dust of the highway and the noise of rattling teams. We are beginning to learn the advantage of quiet for American nerves. It is not necessary for us to see every Dick and Harry that goes up and down the highway, nor to study fashions from our parlor windows. It is very rare that convenience of drainage and commanding position would set a house near the road.

I do not fancy architectural beauty that ends in itself. If you employ an architect, look out for a man who is free from the crotchets of his profession. He will be likely to plan for you an up-to-date com-

bination of artistic features, and a house that after you had constructed it as your home, would be exactly as appropriate on your neighbor's lot as your own. Understand that this house of yours is to fit your conditions and to do it exactly. Beware of "gingerbread work," as it is aptly called — those fanciful adornments that make lots of trouble as well as cost, are easily broken, and soon get to be a veritable nuisance.

I know one house in the country that is painted in checks, like a Highlander's plaid, because there is something of the sort in a neighboring city. Down our valley stands an octagon house, possibly economical of room, but out in Nature it is an oddity. I do not think that Nature ever built an octagon anywhere. Neither man nor house should be so conspicuously peculiar as to defy Nature — and stand around like sheared evergreens, or hedges that are trimmed box style, with crowing cocks on top.

In the country we seldom need to climb very high into the air. Two stories are enough for a house, but learn to abominate half stories with their hot attics. If a magnificent landscape is to be commanded, of course a three-story house is to be tolerated — at any rate get at your property that lies in the distance. The first floor, however, is where we should live; with stairs as few as possible. There is land enough in the country, and we should broaden out at the bottom.

Of course, this general rule must be modified where

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the land is so level that the nights are foggy. On some of our flats I would not like to sleep in the lower story. This, however, we do not mean to take into our estimate very largely when seeking a country home. Up to the present most people can find for themselves purchasable property that does not lie low or too level.

If your house is built on a steep hillside I advise you to anchor it well in, that is, let the basement be excavated into the side of the hill, and in that basement arrange your cellars, your laundry-room, your furnace room, and possibly your kitchen. In this way you get both strength and protection. Above all, you can easily create a wholesale apple cellar, frost proof, but cool enough for keeping your fruit sound until May or June. Good cellars are a rarity, and bad ones are abominable, as well as dangerous.

These basements should not be mere dugouts, but the most carefully planned and constructed part of the house. Sometimes in excavating you will touch a vein of water; carry it carefully through your cellar or basement and put it to use for your hot water furnace and your laundry. It will not be at all out of place if it run through your apple cellar and so keep the fruit from drying and wasting.

There should be no back side to a house. It should front all ways, only with a different outlook; for there is no direction in which you will not find the beautiful, and the most beautiful very often lies

right in the rear of a country house, where there are slop holes and shiftlessness which spoil everything. You ought to be able to walk around a house in the country without distress, or catching a bad odor, and there ought to be an equally cheerful welcome for you with porches and balconies, on all sides. Around the kitchen door particularly there should be neatness and sweetness.

Keep clean on all sides, and do not indulge yourself in slovenliness out of sight of the street. This is one reason for building back from the highway; it puts you on your honor to be decent, and to develop the beautiful. Besides this you will feel that your home is not built for others to look at, but for yourself to see, and to smell. Flower beds are preferable to ash heaps and decaying refuse.

Your house should be adjusted to all other buildings on your place. There is no reason under the sun why a barn should be less beautiful or attractive than a house. Often of an evening I sit in an easy-chair at my barn door to enjoy the moonlight. As I have told you before, cows and horses like cleanliness and they understand the beautiful. Cows will generally lie down with their faces toward the harvest moon. For this reason humanize all the buildings where your animals are housed.

My laboratory, of which I shall speak more very soon, is an adjunct to the barn. I would make the bee yard also a charming place, not a tight little inclosure to be stung in. If the yard is large and

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shady, with basswood trees reaching over, you will find your bee yard a very peaceable place, where you can sit and enjoy the marvelous industry and skill of your winged allies. In other words, create harmony in all parts of your place and have no part that is dissevered from the human.

A foul stable or outhouse is not only bad in itself, but it spoils the whole thing. You will find dirt to be a disease. Dirty stables mean a dirty disposition to begin with and will breed dirty dispositions in the children, and there will be traces elsewhere. Piles of old lumber and ash piles and other refuse can just as well be put into the compost pile as be scattered about in disorder, but a barnyard ankle deep with rotting stuff is an unendurable waste and an abomination. Clean up, and let your animals have tidy quarters; even the pig likes cleanliness. I have grape vines running all over my barn, and plum trees hanging over the fence, as well as a big apple tree that spreads its shade at noon day.

Animals degenerate in disagreeable surroundings as surely as they become humanized by humane surroundings and treatment. My neighbor Harding built a house over his barn well, "Because, sir! my horses, eight in number, would take two hours drinking every morning and every night; for they would be looking over the valley. I think, sir, you have observed that horses know more about Nature than some folk."

I took blinders from my harnesses long ago, be-

cause my beautiful Morgan saw as much and enjoyed as much as I did. I wished when traveling to keep her in full sympathy with myself. The result was that she helped me through many a pinch with broken shafts and straps on dangerous hillsides.

You should know that there are intelligible languages all about you and you can much better spare Latin and Greek than catbird speech and robin poetry. Do not be fooled by the school houses; you were born in an academy; you live in a university. For this reason I hold it to be immensely important that you get your whole place into harmony, one part with the other. Let the whole be a study, and as for the birds, let them comprehend that the nearer they are to you the less they are in danger of losing liberty or life.

Finish the whole house in wood, ceiling it with any native lumber that you can secure, for there is hardly one of them that cannot be finished admirably. Butternut and chestnut and cherry are often attainable, and they are exquisite for house finishing. In the South I use Florida pine (the yellow pine of commerce) and it is beautiful indeed. It is not impossible to secure enough curled pine to finish our houses elegantly. Nothing can excel curled black walnut, and even yet in some of the best wooded Western States this is obtainable. Maple puts itself forward in many charming variegations.

When we learn to put a little thought to this business and get rid of plaster, we shall not only greatly

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reduce the work of building, but we shall find opportunities for making our houses more beautiful, as well as wholesome. Lath and plaster are an inheritance of poverty. They involve incessant dust and breakage, repapering for fashion, and nothing is ever quite tidy; with all the rest they are the hiding place of germs, if we have sickness in the house. Your ceiled wall may be oiled over at any time, and fumigation cleanses it much more easily. I have known typhoid fever to be passed on to three successive families of tenants, in a very handsome house, until the plaster was entirely removed, and the house could then be made sanitary.

This may be a hobby of mine, all the same I feel capable of defending it. Apart from this I hold that natural wood, finished in oil alone, is the most beautiful wall that can be built. We have not yet learned to appreciate the beauty hidden under the rough bark of our maples and beeches and walnuts and hickories and pines. They constitute a study as well as a charm.

The original house of our Saxon fathers was called the All, and it consisted of but one room. Here the whole family lived, dined, and slept. This All was gradually differentiated into apartments, leaving at last the All as a Hall. The kitchen or workroom came off first; then sleeping rooms for the more distinguished. We have now a house subdivided to express the tastes and whims of civilization. Until very recently the kitchen was the home room, the so-

cial center of the house, the workshop and laboratory, where everything was accomplished as a family matter, and individuality was only partly considered in sleeping rooms.

Bridget entered to break up this social life, and now we have to provide for it with what we call a living room or home room, while the kitchen has been degraded into an outside apartment, where no member of the real family is more than tolerated or allowed to pass through. In this country-home house of ours, I would first of all restore the kitchen to its pristine dignity as a food laboratory. I dream of the old-time kitchen of my boyhood, where the little mother presided with a science and dignity that far exceeded any glory that can be secured by suffragettes.

I place the main room of a country home, after the kitchen, as first the home room. This is the gathering place, the social life All, where we grow together, exchange thought, blend emotions, and learn to be truthful, faithful, and loving — bearing one another's burdens. The best part of piety is home piety, social good will and helpfulness. This home room should have the best inlook and the best outlook of the house — full of inspiration, sweetness, and sunshine.

Next to this I place the mother's room, where the babes begin life and child character is shaped. It should be a quiet and sunny room, taking in a lot of morning and free from any sort of casual intrusion.

After this every member of the family should have one room to himself or herself, in which to grow his own individual tastes. Sleeping together is irrational and generally destructive to health and character. There is no need of it in a country house.

A library is needed in a modern house, unless poverty forbids it. In the latter case every child should be taught to collect a few choice books for himself in his own private room. The family room is for music, and not for books or for pictures. It is not the place for reading, but for social life. However, beware of book dissipation, the book disease that has run over into our generation. Fifty years ago a book was a book, and half a dozen dotted a year, but now they are poured in upon us like a Galveston flood. A book at the best is only a translation of Nature, and here in the country it is not right that you should be able to read books and not Nature itself. Learn to listen to the birds and the brooks and to see for yourself.

But I would have, either as a part of the barn or the house, a shop and a laboratory. Ours is an age of industrialism, and at least one-third of our children are born with an instinct for tools. This is growing on us, and it is a good thing. When our children are born to do, as well as to learn, to think for themselves and act, rather than to stuff their memories with book information, it will be vastly better for us.

The laboratory should be a large room and simply

prepared for studying insects, plants, soils, and whatever else constitutes country property. The boys and girls may need some instruction here to start them on a line of thorough investigation, but they should make their own collections of the friends and enemies of our fruits and flowers, until they are capable of original investigation. This will be a source of infinite pleasure and such satisfaction as no one ever gets from reading the investigations of others.

The shop should be an adjacent room, with lathes and engines and a chance for making tools as well as using them. Here broken tools can be repaired, wood sawed, apples ground into cider, and a whole lot of farm industries accomplished. These two rooms will pay one hundred fold on their cost.

Somewhere about a country house there should be what I would call a household shop room or sewing room, the center of household industries apart from the cooking. It is absurd to find a pile of half-made clothing, with needles and thimbles in your chair, in the dining room or library, anywhere and everywhere. A snug and tidy room should hold all this, with an up-to-date sewing machine. I have a sewing balcony, opening from my wife's room, and grown over with a magnificent grapevine. Here is supposed to be done that sort of work which I have described; at any rate it is a delightful spot for gossip and needlework.

Give your wife and daughters just as good accommodations as you take for yourself and your sons. I

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say nothing about a play room, because in the country there is room enough out of doors. I have very little patience for a man in the country who must have a billiard table in his house, and who is out of doors "securing exercise" at golf links. I cannot see such a fellow without a desire to use up a golf stick about his legs. There is his share of work in this world to be done and somebody else is doing it.

I am not arguing against games for the young, nor for that matter against games for the old. Only I would like to have you turn the intelligent and joyous side of work to the front and let the young people learn that work need not be a task, but that it may be and ought to be a pleasure.

Let your house be thought out thoroughly, in every item, with full consideration of your own individuality and the peculiarities of everyone, young or old. Good air and good water should be provided throughout the whole house. A bath room is an absolute requirement, not for delicate bathing, but for plenty of splashing and fun — a place for children to learn the love of cleanliness. Make the windows large and let them swing or slide. There should be at least one fireplace in every country house, and in the Southern States it should be one of the main features of a home. In my Florida house I have four, for sleeping rooms, library, and dining room. It takes but two or three minutes to start a glorious blaze with pine knots or cones, and fuel is so plentiful that you are not inclined to economy.

Morning bathing before such a fire is made a luxury, and a chilly evening cannot get in as far as your bones. As soon as the sun is up the fire may go out, and while hunting about the gardens and wondering at the evolutions of a single night one soon forgets that there is such a thing as a house. In our Northern homes the fireplace should be restored, for it was the most homeful and delightful center of the old-fashioned house. Its heartiness and bigness should not be contracted into a little pinched-up affair like a grate for coals.

An elaborate country house is too frequently nothing more than an elaborate death trap. Underneath we begin with a cellar which is disagreeable, if not damp, and is generally the receptacle of waste vegetables and molds, from which poisonous air rises through all the floors and becomes dangerous when the windows are closed in winter. Then we have our hot-air furnaces, that not only burn and taint the air, but send up through the registers a cloud of poisonous dust. These furnaces are breeding disease more dangerous than sharp exposure to the cold air. I prefer the old-fashioned stove.

The hot-water furnace is not only the most agreeable but the safest. The most dangerous thing that we come in contact with is dust — furnace dust, curtain dust, carpet dust, that is regularly swept up into the air two or three times a day in the name of cleanliness. Examine a bit of this dirt in a spectroscope, and you will find that it is made up of particles of

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every sort of decay, metallic and vegetable — not infrequently poisonous, at all events dangerously irritating to lungs and throat. Both in furnishing and in heating your house look out for dust creators and dust catchers.

When the house is done and well filled with yourself, do not become a slave to decoration. Let the beautiful wood which you have used be finished without any paint or varnish, oiling only the floors. There is every reason why your rooms should not stand on exhibition, as specimens of art, where every manufacturer may display his new varnishes, and the whole house itself invite attention from the street. On the contrary, the house should drop into the foliage with ease and grace, so that one's eyes shall easily pass to the garden and orchard.

No one can come near some of these high-toned buildings without feeling that he must be in full dress, instinctively dropping every thought of simplicity and frankness at the gateway. For the outside of a country house a warm red with dark-green borders is almost always acceptable to garden surroundings. Run it all over with vines and surround it with shrubs and roses; you can hardly overdo this matter of concealment. There is nothing quite so homely and so homeful as the grapevine, and this I would use very freely over a country-house. It is not only beautiful in itself, but it is a great food provider and an ozone breather; love it and praise it.

Select sweet flowers, those giving delicious odors,

especially at night, for they are great givers of ozone and health. There is a very common notion abroad that night air is unwholesome, and I know many country dwellers who will shut it out with closed windows. There is not the least basis for this blunder, for Nature has provided a host of health-giving flowers and plants for the night, and these open along toward sunset, inviting moths to share their charm. Among these the honeysuckle is notable, and you cannot plant it too freely around your house.

There is a difference also in the homefulness of trees, and this you must think about when you surround your house. A beech-nut tree, where the sun and air can get well at it, is an ideal for a near-by lawn, and it is sweet beyond comparison. I know of nothing better than a big, hearty beech tree to sit under during the daytime; but to hang its big arms right over the roof of the house there is nothing better than the old-fashioned and child-beloved butternut. Then among fruit trees I like best for near company the hearty pear trees, that lean over and drop their fruit on our roofs.

“O sound to rout the brood of cares,
The sweep of scythe in morning dew;
The gust that round the garden flew
And tumbled half the mellowing pears.”

But why not live right in the heart of an apple orchard? There is no tree in the world more beautiful than these off-hand apple trees, from the time that

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they burst out into a cloud of pink-and-white flowers until they hang their arms down full of Spitzenbergs and pippins. One may love an apple-tree with a personal tenderness; as for myself I remember nothing with more joy than climbing into the top of the huge Kirkland orchard trees, to sit among the red streaks and look over the Oriskany Valley. There were birds' nests all around me, and every hollow tree had an owl or a yellow-hammer. It is a whimsical fashion, without a bit of good sense in it, that excludes fruit trees from our lawns.

Furnish your house simply and let it be substantial furniture. Not a single article should display pride or ignorance. We lack the furnishing instinct. All sorts of things are tumbled into our houses, mainly glued together and crudely varnished. Stiff and fussy furniture that you cannot sit upon easily is a bad display. I am inclined to believe strongly in that which comes to me as "knock-down furniture," for it gives me the more substantial forms of tables, desks, and chairs, within reach of a common man's purse.

Detest a varnished floor. It looks slippery, even if it is not, and it is always getting scratched. It is probable that you have something else to do in the world besides revarnishing. Neither is there any reason for expensive plumbing, something a little more costly in proportion than the rest of the house. Get a bright-brained carpenter and he can fit up your bath room with a substantial tub and whatever

else is needed at one fourth the ordinary cost of such furnishing. If mosquitoes and flies abound, inclose your balconies and verandas with close wire netting, a very inexpensive method, but very lasting; it will give you that sort of comfort without small annoyances, which the householder rarely enjoys.

Remember all this while that the absolute basis of a happy and successful country home is health. (Our Anglo-Saxon fathers called it wholth — that is, wholeness.) You must keep whole for there will always be all that a sound man and a sound family can do, and you must learn to keep your family always vital, physically and morally clean cut, and full of executive ability. This condition will depend very largely on how you build and keep your house; also largely upon cleanliness everywhere, on drainage as well as ventilation; but perhaps most of all on wholesome food, home grown and brain prepared.

Eating three times a day should forbid a single mouthful between meals, and for most people two meals a day is quite enough — made up largely of fruit and vegetables and cereals, with very little meat. Go to your rooms at eight or nine at night and arise with the daylight. The law of a true life and a happy one is temperance and simplicity, with a satisfied mind. Take as your maxim, from Edward Everett Hale, "Look up, not down; look forward and not back; look out, not in; and lend a hand."

But if you will not obey the laws of Nature and

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lead the simple life, then the country is no whit better for you than the city. It will give you no health perforce, and in the end you will go back to the city dissatisfied. Good air and the perfume of clover and corn blossoms cannot negative the virus of gin and tobacco. Nature does well to give over the lazy and the drunken to weeds and waste. Human waste is the meanest thistle in the crowd.

CHAPTER IV

ABOUT MAKING GARDENS

WE have built our house, and the preliminaries having been properly attended to, have not left us where many are left after building. We already have our drives, there are some shade trees, and our drainage has been taken care of, while our well gives us unfailing water that is absolutely pure, and our cisterns are the house-keeper's joy. Now we want our gardens — dear old English for yard-inns, that is, little inclosures for good things to eat and to look at. What we really want to create here in the country is a garden home.

May is the garden month for New England and the whole orchard belt, clear across the continent, although April has already put in our early potatoes and our first planting of peas, as well as spinach and a little bed of carrots and beets for early soups and greens. If these first things were provided for as they should have been, we are already hoeing one side of the garden, while planting somewhere else. But in a well laid-out country home there will not be so much one garden as half a dozen garden spots.

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In the berry garden there will be, here and there, strips that are fit for a few rows of corn or beans. I learned a lesson from a Western boy who was left in charge of my vacation home while I was in the Western States preaching. Showing me about his celery and his potatoes, he led me at last into the cornfield, and there in the middle, all out of sight, was a melon patch two or three rods square.

He chuckled and I laughed, for what marauder would think of hunting melons in such a place? I find there are two things that boys and men feel it is no sin to steal — grapes and melons; yet these are the very things that give us most trouble to grow successfully and the loss of which we most keenly feel.

The reason for spreading our garden-making over several weeks is, in the first place, that some things will stand frost, while others, like beans and corn, cannot resist the chills that are pretty sure to come in April. The old-fashioned rule was not to plant corn until the twentieth of May, but those who plant sweet corn for succession can venture the first planting about the first of the month. The second planting can come immediately after a frost, if one occur, and at any rate about the middle of the month. Plant sweet corn every two weeks until the middle of June. Follow the same rule with peas, and in this way you get a succession of good stuff for the table until October.

For my part I cannot get on without "greens."

Spinach is not my hobby, although I like it well, and in the South I am able to grow, or collect, all that I want of scoce and sorrel. The first of these is called the "Southern spinach." The easiest of all greens to grow is Swiss chard — a plant closely resembling the beet, but without eatable root, while the whole strength of the plant goes to making leaf stalks as large as small rhubarb or pie plant. Chard will live through several seasons, and you may cut its stalks all through May and June.

Of course we want rhubarb or pie plant and we must have asparagus. Both of these need good strong soil and to be kept clean of weeds. Pie plant can hardly be overfed. Its delicious stalks can be hurried somewhat in the spring by setting over them headless barrels. I believe that everybody considers beet greens one of the best early vegetables. To get these, sow the old-fashioned blood beets and not the new-fangled turnip beets, which do not have any stalks worth the mention.

For late corn, string beans, and peas, one must not only plant in succession, but understand a few tricks of the gardener. I am able to have string beans, that is of the pole varieties, until the very last of October — sometimes well into November. This is done by breaking down a few poles and throwing corn litter or straw over them on freezing nights. The beans will go on forming, and string beans are always delicious. I do not grow the little runted sorts that are found in the market, but varieties

that I have myself originated. These are eight inches long and with beans in them are three inches around — not quite so big without beans.

Green peas can be had on the table until the first of August — with especial care till the middle of that month, but not later, for very late plantings will surely mildew. The earliest corn should come on the table in June, and the later sorts should not be exhausted before October.

I told you how my boy George managed to grow some fine melons. The center of a cornfield not only hides the delicious fruit, but shelters the growing vines from cool nights and high winds. I have since tried the plan myself successfully. But you must have the hills well made, a little above level and of rich compost. A spoonful of hen manure, well mixed with the dirt — be sure of that — is excellent melon food.

Growing vines require that the seeds shall not be put in until the ground is warm; with me this is generally about the first of June. They must start quickly, grow quickly, and not at any time be checked by a dry spell. If there is not abundant rain, take liquid from the barnyard manure tank, dilute it two thirds, and pour a quart into a hole dug by the side of the hill.

Now just here let me stop to explain the philosophy of watering. As generally applied, water is as likely to do damage as service. If sprinkled on with a hose it is almost certain to cause disaster. This is



WOMEN HAVE THEIR PLACE IN OUTDOOR WORK

true, not only in your melon patch, but in your strawberry bed and among your flowers. This sprinkling rarely wets the ground more than half an inch deep; a quick evaporation then takes place, and the surface of the ground is hardened. As soon as this occurs the absorption of atmospheric moisture ceases, and the plants dry up far more rapidly than if let alone.

If you water at all, water thoroughly. Suppose you desire to water a strawberry bed; let one person go ahead and dig a hole by the side of each plant; into each of these holes pour not less than a pint of water and another pint soon after; then let the holes be filled with dry dirt, which prevents evaporation. The water is in there, and the roots will get it. Such a watering ought to last two or three days, even in a dry time.

I had better add a simple plan of irrigation, without what we call watering at all. The simplest way is to run two-inch tile underneath the plants, below the reach of the cultivator. When irrigation becomes necessary, the lower outlet of the tile can be blocked and the water turned in. When the tiles are full enough, water will soak out into the soil.

A plan used at some of the experiment stations is to let water run through V-shaped troughs made of inch boards. Water is allowed to flow from the troughs through auger holes. Subirrigation is by all means the best. Running the cultivator, to keep the surface loose, is, however, the best plan for preventing the escape of moisture from the ground

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and to secure its ready absorption from the atmosphere. This is not possible after the plants get large enough to cover the ground. In Florida I find that subirrigation is quite important, but just now a system of overhead pipes for sprinkling is quite popular.

I would not undertake to run a garden without a thorough understanding of mulching. Mulching means placing a quantity of loose material over the dirt and around each plant that we set or grow. It is a term generally applied to planting trees, but you should mulch all plants — asters, and other flowers moved from your hot bed, your roses and shrubs, beans, potatoes, strawberries, and raspberries, as well as your apples and pears.

When you have one of your petunias or pansies well pressed into the ground, place around it a double handful of light compost to prevent the evaporation of moisture from the soil. When you have transferred your tomato plants from the hot bed, put around each one a shovelful of compost. There is not a thing that you can plant or transplant that will not be the safer with this treatment. If a dry spell comes on, your little plants will still keep fresh and green. The compost that you use should be well-rotted manure, made of old leaves, barn manure, and coal ashes.

The best way to plant potatoes is under a complete covering of old straw or grass. In Florida I use the fall grass, which is of little value as hay.

The potatoes will come up through this, and they will need neither cultivating nor hoeing. Over your strawberry bed, as cold weather comes on, spread a covering of compost, not necessarily quite decomposed, but entirely free from seeds. In the spring rake this winter protection off the plants into the alleys and let it stay there as mulch, to be plowed under in the late summer.

So you may go from garden to garden, and there is not a spot where mulching is not all important. As for setting roses and shrubs without mulch, you will lose the best half and stunt the rest. It will require watering continually to keep them alive, whereas mulch would have saved the whole, and generally without irrigation. I want you to put emphasis on this matter of mulching, because it will save you a lot of labor and vexation.

So we make garden in the Northern States along from April till July, but in Florida we make garden when we please—planting Irish potatoes in February, melons in March, but our cabbages are ready for cutting in January, and our celery and lettuce we harvest three times a year. The best time to make garden is when we can get our crops ready to touch the empty Northern market ahead of anybody else. Florida laughs at all other lands, because it can put its peaches into Philadelphia and New York two weeks earlier than Georgia, and it is the same with melons and cucumbers.

However, all of this is not as easy as play, for a

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winter garden may get a touch of frost once or twice during the colder months — any time from November first to March first. Plenty of water to sprinkle with is protective, but we have straw or grass between our lines of peas and potatoes, to toss over them when the weather threatens; possibly four or five times during the winter. Winter is also our dry season, and if quite dry, we need a gasoline engine and an irrigating system.

I am not going to write an essay on gardening, in which you will find those directions commonly given in a seedman's catalogue, for in any case you will have to learn most of your gardening by experience. I shall give you only a few general rules that will save you serious mistakes at the outset.

In the first place, your garden land must be absolutely clean and well tilled. The cleaning must be done before your planting. It is utter folly to undertake to hoe quack grass out of a strawberry bed.

In the second place, vegetables should be grown, as a rule, where the ground is deep and rich, and that means generally near your barn. You need some things, however, like herbs and rhubarb and lettuce, near the house. A little back-door garden, made very rich, is extremely handy for the housewife. Remember always that house slops, which are generally thrown away, are very useful around garden plants, and are especially good for dahlias and some of our strongest growing flower plants.

Garden land must also be capable of thorough drainage, as well as easily irrigated. A soggy spot will grow nothing well, while a few tile will turn the same ground into friable soil, giving you luxuriant growth. This is true of trees and bushes as well as vegetables and flowers. Thirty to fifty per cent of sand is all right, if it is well worked with compost. Garden land will have to be well fed, because we expect it to do a lot of work. Beans and peas, however, feed the soil its most valuable constituent, and while they *like* good soil they also *make* good soil.

This wonderful discovery concerning legumes (including beans, peas, and clovers) is recent, and no one is fitted to be a gardener unless he understands it. The legumes are the only plants able to take food directly from the air, and after using it, to leave an enriching deposit in the soil. All the clovers will do this for our meadows, and the beans and the peas will do it for our gardens.

In the Southern States we have a much larger list of these air feeders, especially cowpeas and velvet beans. On my place at Clinton, N. Y., I am constantly making spots barren for corn and others poor for potatoes. I plant these with beans, and after a few years they are brought back to corn fertility. Bear in mind these three or four preliminaries, and you will learn the rest as you go on with your work. Gardening, however, will always be, to a large extent, experimenting. New sorts will

all the time be offering themselves for propagation, and you will yourself originate better things.

As far as possible, gardens should face the south-east, or east, and take in as much as possible of the morning sun. There is more growth under the morning rays than under the noon rays, and the rough winds do not sweep as freely down from the northwest. The heat accumulates in the soil during the day, and there is less danger of a late frost in spring, or an early frost in autumn.

Shade suits a few things and hot noons please other plants, but on the whole that growth is the most perfect and the most rapid which takes place under the morning sun. Corn is an Inca and likes sunshine from the rising to the setting, but potatoes will grow in the shadows. In the fruit garden raspberries need the full sun and all they can get of it, but currants will do just as well under the overarch-ing apple trees.

The old-fashioned garden was notable mainly for incessant weeding. I recommend to the country-home maker to grow very little of that which requires the owner to be much on his knees. I like a little of this sort of work — very little, and what I get of it gives a relish to hammocks and veranda chairs. I am willing to get down to weed one or two rows of beets for greens and a few carrots for early slicing in butter, but for the most part I prefer to buy my parsnips, beets, and onions. The kitchen garden which I have spoken of before, not far from

the door, can accommodate a few herbs and turnips, and such things as the mother may want to pull in haste.

The right sort of country woman is coming by and by, who will do nearly all the gardening and much of the fruit picking. I do not think a woman should do only indoors work. Hers are by all means the hardest tasks in ordinary American life — in the country. I pity the dragged-out housekeeper, sweeping, dusting, washing dishes — what a dreary and detestable monotony of life. The coming woman will help out of doors and the coming man will help with the work indoors.

But this kitchen garden fits the interlude, as work is now divided. It should be half flowers and half vegetables, with a corner for summer savory and sage. These two are about all the herbs that we need, provided only we can get a handful of celery seed or of parsley seed when we want it. Perhaps it might be as well to keep this corner open to a few roots of parsley. I am glad to say that caraway and fennel seeds are not as much in use as formerly. In the old-fashioned days we had to nibble at a bunch in church of a Sunday, during the long sermons and prayers, to keep our heads from nodding.

However, let the woman do as she pleases; this kitchen garden ought also to be full of whimsies — where a woman's hobbies show themselves — changing every year if she desires. I have my hobbies

also in the orchard and field. Give her help when she asks for it, and make no masculine remarks. Some years you will find forget-me-nots and mignonette; other years petunias and stocks.

I have never seen a real Nature lover who did not change likes and tastes. I have had my dahlia spells and my aster years, and just now am delighting in phloxes and hollyhocks — the nasturtium alone has remained a perennial delight.

I am sure that I hear you say, Where now is this garden that we are to make? So far as we can see you have turned our whole property into one great floral, vegetable, and small-fruit park. Is that your notion of a country place? You have hit it exactly. Every corner and nook of a country home should bloom with something and bear something. My new neighbor just over the fence asked me if I objected to his cutting the tendrils of a huge grapevine that, climbing forty feet high on a wild cherry tree, hung down in great loops and tangles over his way as well as mine.

I told him he could do as he pleased, but I would advise him to wait until the middle of May. With May every line and loop was alive with flowers, and the fragrance went in waves over his lawn and into his house. He said, "I would not cut it for one hundred dollars." One must, however, consider his neighbors in planting, for if trees reach over they may cause a quarrel; somehow the more acres some

people have the more uncomfortable they are about boundary lines.

Apples that fall over the bounds belong to the land where they fall. If a grapevine creeps inquisitively through the fence your neighbor may shear it off close to the boards — that is, if he have a bit of spite in him. A quarrel is always in reach of the quarrelsome. Vegetables make less quarrels, but you may as well be careful about your compost piles and not have them where the drainage can be complained of.

I can hardly escape the necessity of making one or two lists for you in the way of best things to plant, the real invaluable for a quiet country garden, the varieties that I have tested and am willing to endorse as first rate. Of asparagus there is nothing to compare with the improved French Argenteuil, a variety that was brought to this country and first planted in South Carolina. It is the earliest by ten days, the largest, and most delicious. In market it brings twice the price of any other variety.

If you love this vegetable as I do, you will have a tidy bed at least two rods square, and it will be absolutely clean of weeds. A good plan will be to throw some litter over your asparagus bed as a winter covering and then burn it over as soon as the snow thaws in the spring. The Conover's Colossal is the variety generally grown and is very good, but by no means equal to the Argenteuil.

Rhubarb, or pie plant as the housekeeper calls it, is generally a very inferior and watery affair, but the Linnæus is an improved sort, not quite so big as Victoria, but wonderfully better. I grow both sorts, because I like both quality and quantity, and both these sorts are good. I have already told you where to grow it, where it can get the richest supply of food.

I have never seen any better than that which I saw growing just outside a Maine farmer's barnyard. I think many a country homestead could adopt this plan of getting very early and very luxuriant spring sauce. It is called pie plant because it makes delicious pies — when it is worked up by a born cook.

Among the beans there is nothing to compare with the new Burpee Improved Bush Lima. This is a real lima bean in size of pod and bean, but growing in the bush form. It produces magnificent crops, six inches long, full size beans, and moderately early. Of the cabbages you must find out by experiment, and the same with the celery, for there are dozens of varieties of each of these vegetables, all having claim on the gardener. A small family in the country can grow all the cabbages they can use by setting plants in little vacancies among the berries or melons.

Celery does not need the hard work that was formerly given to it, for it bleaches itself, and perhaps the Golden Self-blanching is about as near perfection as we have yet come. It requires no banking except placing boards on each side. If you have pa-

tience and will give special care, try a few cauliflower plants, either the Early Alabaster or the Pearl of Denmark. I like this delicious vegetable when it is well cooked, but, alas! it is easily spoiled.

As for lettuce it is impossible to get it worth the plucking unless you can give it an exceedingly rich bit of ground. Try a place where you have had a compost pile until the ground is saturated with food. Fork this up very finely and sow Mignonette and Golden Queen. Mignonette will give you, very speedily, small heads, about as big as your fist, and delicious.

If there is room, make right here by the lettuce a small bed for beets, carrots, turnips, and salsify. Remember that this is the place where you must get down and pull weeds, as well as stand up and hoe them. The richer the bed the smaller it may be, for you will get just as much from ten feet square in rich deep soil as you will from three times that space of hard soil.

I give tomatoes precedence and am willing to spend more time and trouble with them than with most other vegetables. They are started in a cold frame or hot bed, and no plants are ever set in the garden that are not as thick through as your finger. Thin them in the hot bed until they are very stout; then take them up with a liberal supply of dirt, set them out six feet apart, crowd down the dirt around them, mulch them thoroughly, and my word for it you will have to tie them to stakes inside of a month

and the loads of fruit will keep you in high spirits. The two best varieties are Golden Queen and Livingston's Stone, although there are several of the reds of about equal quality. The Jack Rose and Earliana are notable for being very early and at the same time solid and of good quality.

Melons are halfway between vegetables and fruit, and there are so many thoroughly superb sorts that I can only give you a bit of my own experience. On my Northern home I have succeeded with Jenny Lind and the Emerald Gem among muskmelons, but with watermelons I have had no success whatever in this climate, with the single exception of a yellow-fleshed sort, the seed of which came to me from Italy. In Florida the Florida Favorite and the Dixie are two of the more popular sorts, but the Triumph is a new sort that meets with great and deserved favor. Probably Kleckley Sweets, Paul's Bonny, and the Bradford are about even rivals and all worth testing. The Rocky Ford muskmelon is nothing more than the old Gem grown under favorable conditions.

Now we have the sweet corn and the peas still to provide for. I grow no corn except hybrids of my own creating, crosses of the Black Mexican with the Minnesota, recrossed into Henderson, with the blood of the Golden Nugget intermixed. It is incomparably sweeter than any that I have been able to purchase. The two best peas that I grew during the last year were Senator and Carter's Danby Stratagem.

My ideal is always a plant that does not grow more than two or two and a half feet high, yielding heavily and of the finest flavor. For a long while I found nothing better than May Queen and A No. 1. Dainty Duchess is the newest claim to favor, and I know enough about it to give it special room in my next garden and highly recommend it. Onions and a few other vegetables, I have already told you I leave entirely to the market gardener, of whom I can purchase.

I have named enough to set you at work, and I can see you getting up very early in the morning all through the summer months to take a look at your growing things. I can see also the pride with which you carry in your first tomatoes or a bunch of golden carrots. Your rhubarb will make earliest spring joyous, and your string beans, following my directions, will not be all picked before November. You recall what the Emperor Diocletian said when asked to resume his crown, "Come and see my cabbages."

By the way, I do not think that I have said enough about beans, but I have told you how they enrich the soil instead of impoverishing it. I advise you to grow them liberally and only of the best. My crossbreeds are my pride. The best of them will some day be placed on the market. I have reduced the selected sorts to five well-established kings of the legume kingdom. My advice is that you use much of your enthusiasm in starting new sorts yourself. There is nothing quite so noble as making this world

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richer by embodying your hopes and thoughts in improved foods for the human race.

You have heard a good deal about Mr. Burbank, and perhaps you have seen some of his creations. If he had given us only the Burbank potato that would have been enough, but he is giving us new vegetables and new fruits, so many that we might almost have a Burbank garden and a Burbank orchard. Others are doing quite as excellent work, and the time is coming when any decent farmer will be ashamed to die without leaving behind him some new product of his brains and skill.

Mr. T. V. Munson, of Denison, Texas, has given the world a list of at least fifty new sorts of grapes that embody the finest possibilities of all our native wildings and the best foreign sorts. The Rev. Mr. Loomis, of Japan, has added to his missionary work the exploitation of the Japanese persimmon in the United States. I recently heard a minister, seventy-five years old, say, "Well, I have not lived in vain, for I have given the world the best sweet corn yet produced." His garden work seemed surer of being a benison than his pulpit work.

Now you will say I have not provided for a special flower garden, although I have suggested a big array of the beautiful. I am going to tell you how in a small country home to cultivate some of the choicest flowers with the least possible trouble. Last spring I had three thousand tulips blossoming

on my nine acres, but not one tulip bed. I simply thrust my tulip bulbs down through into the soil of my strawberry beds, between the plants. They come up and blossom as if they owned the soil, but the flowers are gone and the stalks are dried before the strawberries have got out of bloom. When we are picking our berries there is nothing to show that six weeks earlier this was a tulip garden.

Lilies can be grown much in the same way, but the best I have seen were blossoming in the vineyard right along through the grape rows. The easiest sorts for common country folk to grow are the tall White Candidum, a magnificent lily for July, and the Japan Lancifoliums for August. The Auratum, or Gold-banded, will do equally well, if planted nine inches deep instead of five. Our field lilies also do admirably under similar conditions.

Nasturtiums ask only for a hard, barren bank. You simply must not feed them, but you may give all the food you can to the pansies that grow just beside them. Now beyond these flowers make a specialty of daffodils and iris in the spring, almost anywhere that you can press them down along by the hedges or the grape rows. Phloxes alone remain as my hobby, and I will find room for this superb flower, because it is so profuse in bearing, and, if you please, you may cut it down for fall blooming. If you secure a few of the choicer sorts you will have no difficulty in raising seedlings that are improved

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on what you have set. Select your best seedlings, and in time you will have a collection worth the while.

Otherwise among the flowers let your wife and children, as I have already said, run their hobbies. I am pretty sure that you will find plenty of sweet peas and China asters somewhere about.

As for roses you can do as you please; you can either grow them in your shrubbery, or you can have a special rose garden. Only enough roses we will have; it is not home without them. Here is a little list to start you. I do not believe that you can do much better at the outset than to plant what are called the five Cochetts. These include yellow, pink, white, red, and crimson and are entirely hardy. If one had nothing else but this group, he would be well supplied with roses all through the blooming season.

If you wish to select a few of the very best iron-clads, out of what is called the hybrid perpetual class, take General Jacqueminot, Paul Neyron, Gloire Lyonnaise, Prince Camille de Rohan. White American Beauty, or as it is sometimes called Frau Karl Druschki, is one of the most magnificent of our newer sorts. With this plant Betty and Killarney and J. B. Clark, a huge rose of fine quality. Of the hybrid teas I should select Joseph Hill, Souvenir de Wootton, Olivia, and Franz Deegan. All the roses in this class are pretty close to hardy. It might be well to hill them up a little during the winter. Vir-

ginia Coxe is one of the sweetest and most beautiful of the crimson roses.

Of the older roses my favorites have been Gloire de Margottin, Her Majesty, Margaret Dickson, Paul Neyron, Ulrich Brunner, and Clio. If your home is below New York City you can add largely to the list of tea roses; and if you have a home in Florida you may plant about everything that you can find in the catalogues and pick your arms full all winter.

Perhaps I ought to add to the list of very hardy roses, Captain Christy, Giant of Battles, Jubilee, and Jules Margottin. It frets me that I cannot add more to this list, all the while I am conscious that it is unwise. One of the oldest rose growers in the United States announced last year that his name would be borne by a new rose, which he considers the finest ever introduced — that is "Charles Dingee." Look out for this.

Of course we are not to overlook our berries, although they have been in the garden but a very short time. When I was a boy we never thought of growing a garden blackberry, or raspberry, or strawberry. When we wished for berries we went into the forest clearings, and for strawberries into the pastures and meadows. Now we have varieties that take to culture, and most of them will do nothing out of cultivation.

Of raspberries and blackberries, mulberries and huckleberries I shall talk in a chapter on Orchards,

because nowadays we grow these berries along with our plum trees and pear trees. The strawberry only requires a place under the head of gardening. And gardening it is, for of all the plants that we grow, not one requires more care and work to get good results than the strawberry. The soil must be friable or mellow, thoroughly cultivated and clean, and easily irrigated. When the plants are growing they must be fed well, and you have to move your beds about every two or three years. In spite of all this a small strawberry bed is an absolute essential to a happy country home.

I think I have planted nearly all the new sorts of these berries that have come out, all the way back to Wilson's Albany, still sold as the Wilson. Some of these were superb berries, and one of them, the Cumberland Triumph, still creeps around in my orchard. The Sharpless appeared about 1880, and it was the first revelation of bigness and goodness combined — a literal mouthful, and destined to be the parent of a wonderful progeny.

From that day we have had a succession of startling strawberries, each new one always seeming to reach the very climax of evolution. We could have got on very nicely if nothing better had turned up than Jucunda and Green Prolific. But human ambition was aroused, and horticulturists had discovered what they could do. I think not less than one hundred kinds of strawberries followed in rapid succession, each one displacing the other, until at last



THERE IS NO AGE LIMIT IN GARDENING

we seemed about to settle down permanently on Brandywine.

In my judgment, at present, the best all-around strawberry is William Belt, although it has two or three close rivals in Cardinal, Glen Mary, and some of Thompson's seedlings. It is not quite a new berry, but has stood a thorough test for fully ten years, everywhere and under all conditions, and has proved able to give big crops of delicious fruit. Sample is another good and reliable sort for general culture, and so is Chesapeake, and for a just-right year Haverland is a wonder — only it is not good for a very dry or a very wet year. It lays whole handfuls of strawberries down on the ground, so many and so big that the stems cannot hold them up; mulch underneath is needed.

If you will give it hill culture and very rich soil, Marshall will astonish you for size, and its quality is rarely equaled. In Florida I found Lady Thompson to be a deserved favorite, but still better was the old Bubach No. 5 — a really reliable berry that has been tested for twenty years. William Belt, however, will stand neglect or even abuse, and still give lots of big, rich berries, as if it really enjoyed your amazement when you walk along the rows or lift the leaves. It will fight its way with weeds and grass, and still give a crop. This is my choice, except possibly one or two of my own seedlings.

However, do not think that laziness and strawberries can ever harmonize. Keep the dirt stirred

until picking time comes; have plenty of mulch between the rows, and, finally, as cold weather comes, cover your beds lightly with compost—not too heavily, for there is danger of rotting the plants. I always allow the leaves to show through the covering. There has been a great deal of talk about the sex of strawberry plants and the necessity of securing pollen from perfect blooming sorts to bring into fruitage those which lack stamens. There is something in this, of course, but if you plant two or three sorts in adjacent rows this problem is solved. Marshall and William Belt can take care of themselves alone. A new sort called Norwood has just been placed on the market, but the stories about it are so amazing that I will do no more than mention it in this chapter. It seems to be as big as a Red Astrachan apple; I hope not. All we want of a strawberry is to just go into the mouth, or at least to accommodate itself with a single split from a silver knife.

What we have to say about spraying will come in a little later, in another chapter, but we must not omit the hot bed. The hot beds and cold frames are needed all the time, not only to start tomatoes and cabbages for very early planting, but later for pinks, sweet Williams, and anything that you have in the way of biennials and perennials. I like best beds built against a stone wall, if you have one, and I would make the walls of the bed itself of stone or brick. The length must depend entirely upon

how much space you need, but the width should not be over three to four feet.

The slope, if possible, should be to the east or south, or the southwest; best of all to the southeast. A wooden frame is often the best that you can do, and it should be in a sheltered nook, behind a hedge, or possibly at a corner of the barn. The make-up is simply horse manure fermented and over this a layer of very fine rich mold. For some seeds I prefer pure sand and for others leaf mold. You can generally find about what you want around the edge of the barnyard.

You are at last in your country garden, and the puzzles will begin to propound themselves, while others will solve themselves. I have only tried to answer a few of your questions, although you are bubbling over with more inquiries. Do not be foolish enough to write them, but study them out for yourself. Remember all the while that you have no moral or physical right to exhaust your land. Find out how to make soil and how to keep it rich. You and I will have another talk on this subject by and by.

There is almost always fertility below to bring up — especially in sandy land, and there is always a wealth of plant food in the air to bring down. The sum of your problem, and all your problems, is how to get at the nitrogen which you own overhead and the phosphates or potash that you own down below.

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Roll up your sleeves and at it. I wish you may be so happy that you will understand how it was that the Lord God planted a garden eastward in Eden.

CHAPTER V

PLANNING FOR BEAUTY IN LAWNS AND SHRUBBERY

I COME now to a most delightful part of my general subject, where your training and your creative art will find exercise and you can construct your ideas with plants and trees — only do not make too much of your freedom in the way of expressing preconceived or inherited notions, not to say whims and oddities. Nature must still be your very strict adviser, to be counseled at every turn, and we shall hope not to see a lot of leveling and hacking down of beautifully carved knolls, or the cutting away of trees that Nature spent two or three hundred years in building. Now, if ever, we must have common sense, or we shall make our home a mere composite of badly related bits and strips — called lawns.

Let Nature alone, and she will plant shrubberies almost everywhere, lots of them and the finest that ever were conceived. She will cover the hillsides with them, and there will be others down by the creeks and wherever else she can twist a brook to and fro through the meadows. She sets the birds and the squirrels to bringing seeds, some of them stolen

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from our gardens, and she tells them where to plant them.

This is good for the birds for it will give them their future food, and to us it gives butternut groves and maple groves for nuts and for sugar, besides acres of poems, rhododendrons, and lawns of mint and forget-me-not. A few of her shrubs are provided with roots that run under other roots and so get hold of the ground in spite of rivals. In this way we find great patches of sumac along the hill-sides and big patches of elders in the hollows.

She plants her forests in the same way, her great hemlock woods and her beech groves — but always with shrubberies fronting them. I cannot forget the deep glen, visited in my boyhood with only my dog for a companion, where a projecting promontory of blue and red shale was grasped and held together with long naked roots of a single huge hemlock. These roots grasped every bit of dirt, feeding and trailing until they reached the brook below. I dragged rails and fenced in the whole glen, and to-day when I visit that glen I sit under the huge trees that look over the precipice and listen to the brook song among the wild raspberries far below.

Witch-hazels have found soil enough for their roots, and wild strawberries creep up and down. Everywhere there is a shrubbery of all sorts of wild things, out of which have risen, by competition, tall lindens, straight as arrows. Some one has removed the rails and with sharp tools cut away at the glen

openings, leaving only a few apple trees, grafted to Pound Sweets and Northern Spys.

There never were finer shrubberies than those that were planted in the corners of the old zigzag rail fences, where the wild sloes shook hands with the hopple bushes and the great white-flowering elder or golden-rods nestled close to wild asters, with borders of tansy and boneset. In June the wild strawberries widened this border and hid their big clusters under burdock and mullein leaves — like little wild rabbits. In the West I used to envy the great wide-winged wild thorns, covered with grapes and making cool arbors everywhere in the middle of oak forests. In Massachusetts you have seen what Nature can do on the Berkshire Hills and in the Greenfield valleys, while the dwarfed white pines of New Hampshire seem to me to be the most beautiful things in the world.

Nature loves this way of doing beautiful things everywhere. She sends her robins over into our costly gardens, collecting seeds of rare shrubs and sowing them until they become naturalized. So I find among the hills that border my Oriskany Valley, rare viburnums, *cratægus*, and lilacs, with not a few Tartarian honeysuckles and other shrubs from Siberia and the Cape of Good Hope. I enlarge a little on this only to tell you that we have never learned to do this business any better than Nature, or to make shrubberies finer than we can find in the wild.

Walking through Senator Root's famous forest plantations, of which the country has heard a good deal lately, I found the ground dotted everywhere with miniature maples and elms and white ash and butternuts, and not a few delicate young hemlocks — that most exquisite of all evergreens. Along the lee of his older woods there were thousands of small beeches, inviting the planter to use them. Nature could have done all the forest planting that was necessary, and would have done it far better than even Mr. Pinchot himself, if left alone.

I advise you, if you want anything of the kind, to shut out the cattle and see what Nature will accomplish. She knows what the soil wants, and then she knows what the shrubs and trees want. She makes no mistakes in the way of trying to grow chestnuts where there should be maples, or pines where there should be only deciduous tress. Her forests and shrubberies are wonderfully correlated, and in infinite variety.

But now let us turn to our own shrubbery planting, making sure that we do not foolishly undertake the conventional. You already have a general plan of your place, and your house is built into the plan. You did not shape the grounds to your house, but your house to the grounds. In this process you have had suggested to you, I do not doubt, places where you would like to plant a shrubbery, or a tree lawn, or a flower lawn, or a grass lawn.

How far we can follow our first impulses we shall

find out a little later. But one or two things must be set down as axioms, and the first of these is, do not try to exploit your place for the eye of the public—that is, do not plant for those people to look at who happen to be driving by. I do not question our duty to make our places agreeable to travelers, but at the same time we have our own private needs and rights.

If you are a person of wealth, the shrubbery is your chance for gracious enjoyment and retreat, and if you are not wealthy, nevertheless a shrubbery is the best method you have of resting yourself in quiet, while enjoying a full display of flowers. No other plants and no other sort of garden will give you anything like as much of an array of the beautiful as the shrubbery—and at the same cost of money and labor. Through April, May, and early June the shrubbery is the one gorgeous expression of spring joy, and with discretion you may so arrange your planting that there shall be a plenty of blossoming varieties in the later months; but always, and at all times, keep in mind that the shrubbery is particularly your private property.

For this reason I would not place a collection of shrubs directly in front of my house, between my house and the street. Let it be where the morning sun strikes it and where the moon also lights it up for the honeysuckles that only send out their sweetness at night and woo the moths instead of the butterflies. Grouping is all right for some things, but the gen-

eral rule should be to allow the larger growing sorts to occupy the prominent places, and then associate the smaller growing with those already planted, always avoiding crowding.

The present fashion likes to affiliate great numbers of spireas, deutzias, and similar floriferous shrubs in close masses. During the blossoming season this provides a large show, and when the leaves are colored crimson in the autumn the display is attractive.

For my part I love the shrub itself. I like to see what the bush itself stands for, and in all cases you will find that Nature means something very particular and special by her forms of growth. Jamming plants together and intertwining their limbs gives you no chance for comprehending the individual plant and the peculiarity of foliage, or of growth. The fashion also is fit only for public displays, and you will find that shrubberies planted after this manner are generally thrust out before all the people to look at.

What we are planning is rather a cozy and sweet-smelling retreat, where we can go with Nature alone, or at most with a very choice friend. There should be seats in this shrubbery of ours, but not conspicuous. They should be brown or green, Nature's colors, and they should be half hidden under the bushes.

Your collection should be made largely from your own native woods, for you will find in every section of the country quite a number of sorts of shrubs, of real beauty and quality, but rarely transferred to

our homesteads. Scattered about the woods in central New York, I think I could find at least fifty charming and very companionable plants. The sumac is certainly not to be despised, and in some of its forms it can be found in a dozen States.

Horatio Seymour, the mate of Thomas Jefferson among our statesmen as a Nature lover, called the common elder the most beautiful of all American shrubs. It certainly is something remarkable, both in blossom and in fruitage. I like to let it run at freedom because I love the berries in tarts as well as I admire them on the bushes.

The hazel and witch-hopple are marvelously interesting shrubs and can be found all about the Northern woods. The witch hazel is the only shrub that blossoms in November and it can easily be added to our list. Add now the magnificent laurels and rhododendrons, if you live where the limestone does not forbid; while the evergreen mahonia will give you golden balls of bloom, if you will give it in return a place where the winter's sun cannot disturb it. It will add largely to your pleasure, however, if I leave you to make a thorough search of the woods and forest edges and glens of your neighborhood to determine for yourself what may be hidden away that deserves to be brought from its retreat.

Collecting for a shrubbery a few years ago, I came upon a weeping form of wild cherry, more beautiful than any other wild cherry that I had ever seen. I had as good fortune with a *cornus alternifolia*.

If you do not find that some of the seedlings caused by bird planting are novel, just as some of the blackberries and raspberries that are bird sown are worth the transplanting into your garden, then I shall be mistaken. Keep your eyes always wide open for new things.

In this hunt of yours you will also find something else of very great interest, and that is that many foreign shrubs have become scattered by birds eating the fruit in gardens and voiding the seeds in wild places. In this way I have quite frequently come upon Tartarian honeysuckles, Siberian maples, English barberries, rare thorns, European euonymus, with viburnums and lilacs, and I do not doubt that there are many others nestled in the glens which I haunt and waiting for sharper eyes than mine.

The shrubbery bursts into bloom with the first tempting rays of spring sunshine. First comes the little daphne, and if you care, you may cut great bunches of this shrub, to open a few days earlier indoors in water. The forsythias almost as soon become great masses of gold, floriferous beyond compare. The Judas trees may be classed as shrubs, and as such will stand well at the front of all things that blossom. Before a leaf appears every limb and twig is a bouquet of lilac. I wonder that more has not been made of this grand American small tree or bush.

Then come the Japan quinces and the lilacs, and the procession is well begun. You always regret

that each one does not last longer in bloom, yet you observe that Nature's arrangement is after all the best. She gives you just one or two very fine things at a time, to occupy your full attention.

For midsummer and early autumn we are expected to turn to the rose garden and the fruit gardens, yet we have a few shrubs, such as the altheas and the hydrangeas, that do not display their beauty until August — although the noblest of all the hydrangeas (a new find and baptized *Arborescens grandiflora*) begins to blossom in June and continues until October — a magnificent shrub and finer even than the now famous *paniculata*. At this time also quite a number of the May-blooming shrubs are gay with scarlet or purple berries.

A little later, and just in time for Thanksgiving, the euonymus breaks open its seed pods and greets us with a scarlet display, while the witch hazel begins its autumn flowering. You cannot have too many high-bush cranberries, not only to attract the grosbeaks to dine, but because the berries make a delicious sauce, very like the true cranberry. For myself I like a bush of barberries, not only before my windows, but at every turn of my drives, warming up the landscape with brilliant scarlet when the snow is covering the world for five successive months; these berries also make a delightful jelly.

Do not forget to plant a few fine-growing shrubs around your barns and outhouses. I cannot say positively that the cows enjoy the lilacs and the mock-

oranges and the honeysuckles that send their perfume into the stables, but there is something humanizing about these surroundings, not bad at all for the hired men, just as there is something economic in having grapevines that carry bushels of fine clusters on your barn walls. I hate stables and outbuildings that are divorced from the beautiful. I have a lingering belief that the animals are happier when surrounded with that which also pleases me.

A good list of shrubs for you to study, but not strictly to follow, would be, for April, daphne; for May, the golden forsythia (not quite hardy), Japan quinces in variety, prunus triloba, spireas in variety, lilacs in variety, viburnums (including the old-fashioned snowball — only preferring the Japanese sort), and Tartarian honeysuckle; for June, plant lilacs in variety of the later sorts, deutzias in variety, syringas in great variety, peonies in variety, viburnums of a later sort, clematis for climbing, cornus alba and the common elder, with rhododendrons where the soil will permit; and for July and August, besides a few spireas and clematis paniculata, plant freely of altheas and hydrangeas.

I have already suggested that in the planting of shrubs we avoid the conventional. Never plant them in rows, unless it be for wind-breaks, or bordering straight drives. Seek variety in all your grouping. Low-growing shrubs should be planted in front of taller. Grow as a rule in the sod, of course forking annually around each plant; I mean by this

that formal walks should be avoided. If your shrubbery is large enough, you should arrange it so that you may lose yourself when strolling about of an evening or a morning. Your noondays should be spent under the shade of the lawn trees or in the orchard.

Shrubs that are suitable for hedges are rare, because most of them are liable to lean over too far, like most of the spireas, while others are constantly dying out in twigs that deface the hedge. The very finest of all shrubs for this purpose is the Tartarian or bush honeysuckle, but I have mentioned this before. This shrub appears with red flowers, with white, and with pink. The pink-flowering is a little more sturdy in growth and might fairly be selected for a hedge. I have secured a seedling with an exceedingly deep crimson flower and sturdy growth.

Lilacs are defensible for this purpose of hedging, but they will die out in twigs and branches, giving us great annoyance. I have seen the barberry used as a hedge, but the results were always disappointing. Next to the honeysuckle I would place the *hydrangea paniculata*. This shrub will stand considerable trimming, but it must have good soil to do its best. Its flowers are insignificant if the plants are starved. I think the new *hydrangea arborescens* will also make a fine hedge plant, although its growth is more slender.

I could give a whole page wisely to the lilacs. Fifty years ago we had only the common lilac and

the white, and the latter was quite rare. It will not make a fine bush unless given a moist location. The Persian lilacs came into common use only a few years ago, but they have added immensely to the charm of our shrubberies. They are much more delicate in foliage and in flowers, but the whole bushes become a solid mass of bloom late in May. The French horticulturists have been sending us recently a long list of superb new sorts, single, double, and semi-double.

Princess Alexandra, a white-flowered sort; Jean Bart, a double carmine; Leon Simon, a double with bluish crimson flowers; Ludwig Spaeth, of a reddish purple hue and immensely long flower stems; President Grevy, a beautiful blue, very double, and with flowerets of the largest size; and Michael Buchner, with double lilac-colored flowers, make a half dozen of the finest I have seen. They are all of them very hardy and give very little trouble on the lawns if they have reasonably good soil. They will not stand being starved, however, and, as they are all grafted, you must look out not to let the suckers have a chance to grow.

As far as possible I am using the homely old names for the shrubs specified, and where I do not it is because they are not known by any more familiar title than that given, either in the catalogues or in common parlance. When I call upon you I shall expect you to show me a place that you have selected, not too formal, but just out of the line of your daily

work, near the croquet ground, or possibly the tennis court; and I expect to find a bird's nest in every bush. If there is a damp spot anywhere about, it will be filled with dogwood and surrounded by Judas trees.

Hazel bushes and hopple bushes will grow in the shade of one or two wild cherries, wild plums, and mountain ash. If, however, you cannot spare room enough for all of these things, just have a good group of Persian lilacs for me, another of spireas, and another of mock-oranges, although I am not sure that I like any shrub better than the old syringa, with a fragrance that floats off an eighth of a mile. I have not said half enough about the Judas tree, because it is the finest very early shrub in existence; only remember that its wood is brittle and you had better grow it as a small tree.

You will be sure to find seedlings from most of your shrubs, coming up year after year, generally to be mowed off or hoed out. Let me advise you to have somewhere along by your berry gardens or plowed fields a little nursery to which you can transplant these children of Nature and see what they will come to. Give them in charge to one of your boys or girls, with the understanding that he will own the finer ones. In this way you will bind your children to country life, and at the same time you will be sure to get a lot of very fine new varieties of shrubs.

No two seedlings will come just alike. I am very proud of my cross-bred mock-oranges and honey-

suckles, and I have one barberry that outglorifies everything in the catalogues. This business of cross-breeding is very simple if you let the bees do the crossing, and you only do the selecting.

Nature, if left to herself, does not count a lawn into her contrivances. A lawn implies too much of the artificial for her somewhat wild notions and always means human folk about. The cow path and the squirrel track she takes into her reckoning, but no straight walks and no driveways, and certainly no sheared evergreens or sheared grass plots.

Lawns, however, we must have, and a right sort of a lawn is indicative of civilization. If you have a lawn between yourself and the street, at all, it should be made up of trees, in a grass plot, not sheared every day, but kept tidy and mowed three or four times during the summer. It will need a lot of good taste to create a lawn of this sort, and I believe that nine out of ten make robust failures.

Nothing in the world can be worse than a collection of weeping trees, or sheared evergreens, and a lot of odd or peculiar trees — forced to keep companionship which they do not like. There are some trees that have the fidgets so badly under these circumstances that they become diseased. On the other hand, there are very strong friendships among trees. The oak and the pine make good neighbors.

The white elm likes to be alone — running as high up into the air as possible and then letting its limbs droop gracefully down, to get as much more

air and sunshine as it can. It spreads over the largest possible space for the sun to kiss. The red elm is quite another thing and has never lost its woodland ways. It loses its lower limbs, but has never learned how to run up aloft and spread out a canopy, like the white elm.

While planting the Kentucky coffee tree, one must know that the female grows almost as erect as a Lombardy poplar, while the male tree spreads out through a surface of thirty feet in diameter. It needs a good deal of this preliminary knowledge of trees to avoid serious blunders. While the maple is always charming for shade, you must know this one thing, that if trimmed up after it has attained size, the sun striking the bark will surely split it. Then will set in the worms and death.

The scarlet maple is peculiarly beautiful, and better yet is that variety of the scarlet which we call swamp maple. I advise you to go into a marshy place in the fall and note the wonderful variety of coloring among the maples; then mark two or three of the more beautiful for transplanting.

There are, however, three trees, yes, four, that I place ahead of all others for single lawn trees. The first of these is the beech. It is rather slow growing and needs room. One tree is quite enough for a small lawn, much better than a crowd of elbowed affairs. The beech naturally heads out very low, giving you just room under the limbs for a rustic seat and a bit of a lawn party.

Next to the beech comes the Norway maple, the very ideal of rapid growth, glorious foliage, and rich coloring in the fall. The juice of this tree is milky and acrid, preventing the attack of worms. I do not remember ever seeing a Norway maple in the slightest degree defoliated.

Third in rank, perhaps it ought to go to the front, is the *Catalpa speciosa*. America should be proud of this grand native production. The wood is among the very richest possessions of our country for telegraph poles and railroad ties, while in May there is not a woodland or lawn tree that gives us a more superb array of blossoms.

Mr. E. Y. Teas, now an old man, at Centerville, Indiana, some years ago sent us out hybrids of the native catalpa with the Japanese. I have some of these growing in Florida and others in New York State — equally thrifty and beautiful. The color of the foliage varies from a rich purple to a golden green, and if your lawn is small I advise you to get some of these hybrid catalpas. Cut off the leaders, and the trees will spread widely and dip their branches full of flowers clear to the ground.

My fourth tree for American lawns is the American linden, or basswood. It is hard to tell why this tree has been so much neglected, except that the wood is too soft for fuel. For a lawn tree it has every requisite, spreading out grandly and just far enough from the ground, while in June it is one mass of deliciously fragrant flowers. The foliage is large



Photograph by Jessie Tarbox Beals.

EVEN THE BARN SHOULD HAVE ITS SHARE OF VINES AND HEDGES

and the shade perfect. Better yet, it is the great bee tree of the world.

I have advocated the planting of basswood along our streets and everywhere else in order to increase honey production and the wealth of the people. This linden could easily displace the maple — as the maple is commonly grown (a haggard, diseased, worm-eaten affair, giving poor shade and suggestive only of decay). If rightly grown, the sugar maple should surely have its place with the four that I have selected, only it is not often rightly grown.

I am sure that some of my readers will call me to account for not naming the white elm, and really, if conditions are just right, I would name it specifically and in the front rank. It is a wonderful tree, only remember that it takes a long while to make a really useful lawn tree of the white elm. If you plant it, be sure that it has most abundant room and that it stands where its shade will not be needed for ten or fifteen years.

The white ash also has some strong claims on us, but mainly for street planting. It heals over wounds easily and will remain in fine condition for shade for at least one hundred years. If you plant the maple, let it be trimmed up just about as high at planting as it will ever need to be when full grown. I have already told you why this should be done. The country is full of maple trees, and hardly a sound one among them.

Plant English trees for late autumn. The Eng-

lish oak, the Scotch elm, the English beech, and the European linden all come to us with established habits that they do not easily yield. They hold their leaves in autumn for two or three weeks longer than American trees of the same sort. King Charlie's oak and the Scotch elm give us their russet leaves until well into the edge of winter — the oak sometimes all winter.

In Florida I find that the water oak and the persimmon and the black jack oak are to be reckoned with for midwinter foliage. The persimmon gives us a fine show of mixed scarlet and yellow, while the black jack, a little later in December, is gorgeous with its motley hues. This sort of foliage is hardly disposed of before the sweet gum and the sugar maple put on their spring foliage and their crimson blossoms.

So it is that everywhere there are enough of fine things, growing where no man can turn them to rhythm or joy, and what can one say about it all except that Nature does not like the ugly and that the soul of all things is beautiful. Learn to look around you, and you will find material everywhere waiting for a place on your lawn. A tree lawn needs judgment, however, or you will gather together trees that do not mate well and will soon become diseased.

I have spoken slightly of weeping trees and of sheared trees. I do not mean that weeping trees should be always discarded, but to plant a distorted affair in the eyes of the public, simply because some

of its limbs twist down instead of up, is a mistake. There is one elm, however, the Camperdown, which may be classed as an exception. Its graceful growth makes it form a very acceptable arbor.

As for sheared evergreens, they are monstrosities and nothing else. That does not mean that an evergreen tree should never be trimmed. Rational heading-in will thicken the tree, and will not distort it.

As a rule, your evergreens should sit flat on the ground. Nature devised them in the earlier periods of the world, before there were any deciduous or flowering trees, when the elements were ruder and vegetation must have the very best defence against storms. The natural form of the evergreen was therefore then, and still is, a perfect cone, and it should never be trimmed up, unless the reason is very peculiar and apparent.

The word lawn probably conveys to most minds a grassy turf — a yard of clean grass. Sometimes it means just a front yard over which the lawnmower is incessantly run from the last of April to the last of October. More of these lawns are grass plots, more or less filled up with miscellaneous flower beds and shrubs. This mixture is well enough to start with, but if your homestead grows and develops, the flowers should have a place for themselves, while the shrubs constitute the retreat I have described.

It is not impossible to combine the flowers with the vegetables in a garden by themselves and so leave

out of the lawn question all flowers except the shrubs. I do not forget, however, that around the kitchen door the country home-maker has place for a few pinks and annuals. Remember always that you will spend more time and patience planting and weeding a few balsams and asters than you will caring for a shrubbery of a quarter of an acre. I have outgrown nearly all annuals and most of the perennials, and what I do with the rest I have told you already in my discussion of gardens.

What to do with roses is also a problem. Huge growers, like crimson rambler, can have a place in the shrubbery, and it is not impossible to border a shrubbery with groups of hardy sorts very effectively. Roses, however, call for a good deal of labor, watching and trimming them and removing the old buds, besides the need of spraying and otherwise fighting insects. I am content to plant them where they can be cultivated in rows by horse power, as a rule. In Florida it is different, for our rosebushes get to be great shrubs, needing no winter protection and almost always in bloom. There we can let them stand eight or ten feet high to constitute a shrubbery by themselves.

Let me protest, however, against the waste of time and the lack of good taste that would create for a lawn a smooth greensward, out of which is picked every day any little dandelion or wandering clover. It requires constant running of a lawn-mower also — a rattling affair that I never could endure, and it

also refuses to take into account the beauty of a grass spire five inches long.

I want you to learn to appreciate the grass. It is one of Nature's chief works. She tried her hand at it again and again, as she did at making trees, and whether it be stately timothy, or graceful bluegrass, or daisy-crowded orchard grass, or the bunch grass that grows by the creeks, or the great waving broom grass of swamp lands, grass is always beautiful. Indian corn is only a superbly developed *zea* grass. I do not believe that putting the razor to the face of Nature every morning is any improvement.

In the fall I find these little fancy lawns all about the country, just about big enough for a city door-yard, and men and women raking them clean of all sweet-scented brown and scarlet leaves. The leaves are burned and the grass is left to be frozen to the core, so that reseeding will be necessary another spring. I differ entirely with these country friends about this matter. I would abolish the lawn-mower in summer, letting the grass grow at least five or six inches high before cutting.

I would have it mowed with an old-fashioned scythe, if you can find anybody still left who knows how to swing it. Any boy or girl of commonsense and decent muscle can quickly learn the old art, and my word for it they will be glad. I question the physical value to a boy or girl of pushing a lawn-mower back and forth by the hour, while as an intellectual operation it is a flat failure.

Climbing the hills not far from my home, I saw my friend and neighbor swinging the scythe in the fence corners.

"I want these corners," he said, "for wild grapevines and Virginia creepers, and over there I am keeping it free for sumac to be scarlet in September, and there are elder berries for August. There is no telling what lots of fine things Nature fills into these private corners — only it is necessary to cut out the weeds."

I said to him, "Neighbor, what are weeds?"

He leaned a moment on his scythe, and said: "There are not nearly as many as there used to be; folks have learned the value of some of the worst, and I guess that by and by everything will be worth something. However, I cannot wait for that — not altogether." And his scythe went on clipping out the stick-tights and the thistles and the elecampane. It was Adam over again, set into the Garden of Eden to tend and keep it.

A Government bulletin informs me that the chief charm of a lawn "consists in an even stand of grass, of uniform color, kept closely mown." I wonder at this, or I should wonder if I did not know that some of our Government employees are young in their tastes and judgment. I look everywhere else for this uniformity of color and fail to find it. How happened it that Nature never found out this law of the beautiful? She has probably never read the bulletins from Washington. My daily wonder is the

infinite shading everywhere of tree-color and plant-color and the impossibility of finding even two apple trees that do not shade apart.

If possible, have a brook somewhere about your property, and your shrubbery may be associated with that, while your tree lawn finds its closer association with the street. Nothing can fill the place of the talkative, happy, moody brook — the only thing in the world that never goes to sleep. It has an Esperanto of its own and it talks understandingly in this fundamental language to all attentive ears.

I love a brook and I wish that I still might paddle shoeless in its shallows. Utilization of brooks does not consist entirely in the use you can make of the water, but in part of the use you can make of its music and its boyish beauty. By all means have a brook associated with your shrubbery if you can — running down a water-carved glen possibly. I do not quite say that we do not want a brook through the lawn or lawns — that is, if it has some dignity and depth. But I want you to feel the distinction between a shrubbery and a lawn — that the one shall be retired, and the other belong to the people.

The lawn should have its relation first to the street; the shrubbery should have its relation first to the house and very little at all to the street. Indeed, the street should itself be a lawn, or part of a lawn, and fully as well kept as that inside the hedges or fences. I would, in fact, take away the fences and hedges entirely and wish there were not one left in

America. Then I would let the careful planting extend down to the ditch that flanks the roadside. All of America will some day become one vast garden home, and the roadways, most beautiful of all, will bind us together in one great family.

After all, the most important part of our lawns is the drives. These should be liberal, even for a very inexpensive residence. Remember that our lives, if rightly lived in the country, are not indoor affairs. Run drives with welcoming breadth to the street and let them lead invitingly about the house and lawns and then to the barns and gardens. You will then be sure that your barns are clean and their surroundings pleasant.

I like also to have a liberal measure of home exercise. There is no good reason for living right by the street, and with that have a habit of going away from home for a walk. Our drives should constitute a most delightful promenade.

Above all, do not form a habit of hailing a trolley car and never walking at all. Walk, man alive! And, my dear lady, walk! It is the finest way of bringing out all your physical powers and stimulating your intellectual forces. Shrubberies and lawns should be used; and this is just what they were made for — to give you health and wholesomeness — a home life, broad and sweet and wholth-ful (healthful).

CHAPTER VI

OUR RIVALS

WE do not like to acknowledge the fact that we are not quite masters of the world, but the fact is we have a hard time to confirm our lordship. As far back as time goes and we have any record of it there has been a battle on the globe between the vegetable and the animal kingdoms. At one time the world was astoundingly overrun with huge plants. Vines of enormous size clambered their hundreds of feet over trees that stood three hundred feet high. Then again there was the Saurian age, when animals crushed the vegetable life under enormous feet and pulled the limbs from lofty trees.

Things tamed down a good deal on both sides before man put in his appearance. With us came in three or four families of plants, the cereal family, the solanum family, the rosaceæ family, and the palm family, and at the same time three or four families of animals, including the reindeer, the dog, the horse, and the cow.

It needs no argument of mine to show that we should have had a hard time on this globe without these friendly neighbors. By their aid we have our

food, our raiment, and are able to travel from place to place. Not a little of the poetry of our lives, the content and the joy as well, is due to these vegetable and animal allies.

At the same time it must be allowed that the vegetable and the animal kingdom alike furnish us rivals that sometimes threaten our very existence. If there is any one thing in the vegetable world got without a struggle, I do not know what it is. Roses, apples, pears, cherries, potatoes, oranges, wheat, corn, it is the same thing everywhere.

I have heard it said that in the good old times all you had to do was to sow or plant, and then reap the finest wheat and gather the most perfect apples. That is nonsense, for during the past sixty years I have seen the growing of wheat driven out of New York State by an insignificant insect, and even with all those years I cannot count back of the codling moth. This trifling but pretty insect has in that time put hundreds of millions of bushels of apples into the waste heap. This is a sorry story to tell of the mastery of man, as compared with an insect. But meanwhile it is this very insect, with a few more, that has compelled us to establish agricultural colleges, has caused the birth of new sciences, and called out our real value in a mighty struggle to hold our own.

The whole year through the fruit grower and the general farmer have a continual battle to fight. It begins early in the spring and does not quite end with

the storage of our crops in cellar and barn. I have seen more than one man whipped by quack grass and others driven from their farms by scales and moths.

These antagonists spoil for the farmers of the United States about half a billion every year, although the amount is being gradually decreased by scientific methods. The largest leakage comes from those creatures whose bread-winning lines cross ours. In some cases we can turn them into friends and make use of them; in other cases we may do as Lincoln did with the politicians, keep them fighting among themselves.

The sawfly is a mean little beggar that puts in its work as soon as foliage begins to turn green in the spring. It has found out in some way that its best forage is the currant bush and the gooseberry. Its eggs hatch first on the gooseberry, and if you are alert you will kill them there before they hatch on the currant. It is not a bad plan to set a row of gooseberries for every tenth row in your currant field, in which case the fly will not bother much with the latter.

Being of English origin, he likes gooseberries as well as the folk do over there, and he will absolutely defoliate your whole garden if he has a chance. The result will be not only total loss of fruit, but a devitalizing of the bushes. If there are any left the hens will take them. In fact there is not a single fruit that the barn fowl likes so well as a green gooseberry — so look out for them.

As for the worms, as soon as they begin to hatch, spray with hellebore and Bordeaux mixture united, as soon as the first nest hatches. One spraying will probably be enough, and it is a pleasant fact to record that this plague of the garden is decreasing very steadily. For the last two years I have hardly lost a day's work in fighting them.

Nearly seventy years ago I saw the curculio putting in his work in the plum yards of New York State, and the rascal, we called him the Turk, has held his own wonderfully. Go where you will, and most people will tell you that their plums blossom well but they cannot get any fruit — the plums all fall off half grown. They imagine the plum itself is at fault, or the soil, or the climate.

The fact is that the plum fits itself to all soils more readily than any other fruit tree and is the nearest to a cosmopolitan that we have in the rose family. It is hardier than the apple and quite as hardy as the pear, only the curculio is everywhere to match it, and it needs the fruit in which to propagate its species. Just when it began to sting the plum I do not know, nor how it learned the trick of breeding in that fruit. It was, however, a wonderful fitness, and so the curculio became our worst rival in the plum yard. Who is going to whip and who be whipped — that is the problem.

Our remedy is very simple, and for once we do not resort to poisonous mixtures. First of all get a pole about eight or ten feet long and wrap the end with

pieces of old carpet or sacking until it is a soft pad. Now get some strong sheeting and make a cloth that will cover the whole ground underneath the tree. Let this be ripped up to the middle so that when spread the tree will stand in the middle.

Now rap suddenly and sharply the larger limbs of the tree, and every curculio will drop on the ground, with his legs rolled up, playing 'possum. Be spry and catch these before they begin to fly away. Crush them or put them into a bottle to be killed later. This process of jarring the trees must be carried on for about two weeks. The number will decrease very rapidly after the sixth day. Only this: remember to begin your work just as the petals are falling from the earliest plums — the Magnum Bonums and Abundance.

In the apple orchard we must have begun our work already, that is just before the blossom petals of the earliest varieties open. The codling moth has been our chief rival with this glorious fruit for at least one hundred years. A pretty and innocent bit of fluttering life, it goes through several stages of existence before it is a full-fledged flier. Its larval state is lived most advantageously in the young apple. The moth lays its eggs in April or early May in the blow end of the fruit. The egg hatches into a small worm, which takes a curved line for the center of the fruit. When it enters the core the apple is likely to weaken on the stem.

If it falls to the ground the larva finds a hiding-

place and goes through a transformation, by way of chrysalis, into a moth. Rather a trivial rival for the child of anthropoids, but he will take the whole apple crop from us, unless we put up a persistent and very intelligent fight. If Sir Joshua Reynolds painted with brains, the horticulturist of our day has to grow apples with brains. A few men of science showed the way, and our agricultural colleges are yet none too numerous or alert in their investigations to solve just these bug and moth and worm problems.

The use of arsenites began, I think, with this very moth, but now it is a remedy in a dozen field fights. The solution must be applied just before the blossoms open and once more just after the petals drop, possibly a third time ten days later, in order to make sure of the crop. The minute spray enters the blossom end and poisons the first meal of the larva. Think of the research and the study needed to find this out, and the resolution on the part of an old-fashioned farmer to turn out of his tracks and *do it*.

In fact, a large number of apple growers refuse to do it, and now our apple crop instead of being larger is relatively smaller to the people, and the price of apples has gone up from one dollar per barrel to five dollars. This dear old fruit is no longer found in the school boy's dinner pail and the poor man's cellar. A good apple costs more than a good orange. There is no higher reach of science than that which enters our orchards and gardens and brings us out victors in the struggle with insects.

But all this while the vegetable world is out of harmony with us, that is with our control, and fungus diseases are at work — more dangerous even than insects. We must begin our contest with this sort of rivalry very early in the spring and it must go on through the whole year. No one can tell just when there will be a sudden development of some form of parasitic growth.

The spores that make plum knot scatter and plant themselves late in the fall, or even in the winter. These grow with immense rapidity, and your whole orchard will be covered in a single season. This must be fought with a sharp knife, cutting above and below the knot, and sometimes sacrificing a whole tree. It is a pleasant fact that some sorts of plums are entirely immune. Pear tree fungus comes in the form of blight and is imperceptible to the human eye until large limbs or whole trees are done for.

Spraying with Bordeaux mixture is a general preventive of these fungoid developments, and it is a good thing, very late in the fall, to give a good spraying to every fruit tree you have. It will do no harm if applied in the winter — better yet very early in the spring, before foliage starts. However, there are many fungi that cannot be either prevented or cured by this remedy.

Your apple and pear trees with scabby bark must be thoroughly washed or sponged, once a month, with strong kerosene emulsion and Bordeaux mixture. This will kill the fungus and stimulate healthy

growth. The same remedy must be used for your grapes and grape vines, but anthracnose must be met with a sponge of sulphate of iron, applied before the foliage starts in the spring.

The yellowing of the foliage on your fruit trees in midsummer means another fungus attack; especially your plum trees may throw off a large part of their foliage just when it is needed to perfect the ripening of the fruit. It is a good thing to anticipate something of this sort with a thorough spraying a little after the fruit sets. In all cases remember that disease is associated with bad management. If your trees are growing just right and are not standing in either too wet or too heated soil and have been trimmed correctly and have not been whipped up too sharply with fertilizers, you are not very likely to see a fungus developing.

It is curious to know that your pear tree blight can be most easily prevented by growing the trees in sod land, not without cultivation to be sure, but forked about instead of plowed, and a good mulch kept continually about the tree. This mulch, I may as well say, is made up most easily of the coal ashes from your furnace, or with any waste material that is porous. Keep it a little back from the trunk and have it thick enough to equalize the temperature and moisture about the roots.

The simplest way to apply hellebore to currants is from a small barrel, rigged with a pump and hose. For a large orchard this barrel can be carried about

on a wagon, but in my own grounds I have the barrel rigged between two wheels and shafts for a horse. This arrangement needs one to drive the horse and one to do the pumping. If you are a fruit grower, you must learn to do your own work along these lines, for most of the spraying that is done by professionals is hardly worth the while. The spray must be put on very fine and until the whole tree is literally wetted.

If Bordeaux and arsenite are to be applied, they can be mixed together, and in this way only one spraying is required. We are talking very freely about deadly poisons and a very free use of them among our fruits. I warn you that this business has been carried a good deal too far in many cases and that much harm has accrued; not only in the way of damaging the crop but also of poisoning the atmosphere. Some of us cannot endure an appreciable amount of arsenic, while others are unaffected. At all events use caution. Not one-tenth the amount of arsenic is needed to kill your potato bugs that is generally used.

Borers are queer creatures; with bodies as soft as hasty pudding, they have jaws sharper than the best steel saw. They will work their way through ash trees and bore young apple trees all into sawdust. They have to be fought at all seasons, especially in our orchard trees. The apple and quince trees furnish a resort for the same borer, and it takes a very short time to ruin a tree.

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The peach tree has another borer which is quite as destructive. You must look for the work just at the surface of the ground, or in the mulch which you have placed about the tree. Clear the way with a sharp knife, cutting the blackened bark until you find the mouth of the hole, then with flexible wire bore the borer to death. Cover the wound with wax, if it be large enough to be serious, and then pile coal ashes around the tree, until the gritty material covers all that part where the beetle has been at work.

A full grown plum or peach tree will need half a bushel of ashes, while twice that amount will hardly be enough for some of your apple or pear trees. It is not a bad plan to anticipate these insects by wrapping your young trees with tarred paper. If you have borers in your grape vines or your currant bushes, cut below their incisions and burn the prunings.

You see that I am making considerable note of coal ashes, and I assure you that this material should never be wasted. It is not only of great use about your trees as a mulch, but as you throw it about your soil, while renewing mulch, it is a capital material to mix with clay and keep the soil loose. Notice that it prevents borers from working, is a splendid material for mulch, and it loosens clay soils, and you can make these three uses unite in one. Some of our least valued everyday material is of more value than the high priced stuff that is bought as fertilizer. I would rather have a few cart loads of anthracite

coal ashes than so many bags of high grade and costly, but lauded, material from the factories.

Lately a new rival of ours has appeared, and so far we are unable to cope with it; at least none of the preventives and remedies that I have named will do the work. It is just a fly; we call it the trypetta fly. In Massachusetts you will hear its work, done in the larval state, described as railroading. The larva is very minute and is very deliberate about putting in its work. The fly works all summer, while the codling moth works only in the spring. Sometimes the eggs do not hatch until your apples are in the bins for the winter. If the cellar is warm they will do their work even in January, and gutter your Jonathans and sometimes your Spitzenburgs ruinously. The skin of the apple remains fair, but at heart you will find nothing but a black mass.

The fly has its favorite varieties to work in, so that some of our fine old summer fruits, like Sweet Bough and Golden Sweet, are practically banished from the orchard. I have not seen a thoroughly clean Sweet Bough for ten years. This fly so far has the best of us. Spraying does not touch the larva, for the egg is laid through a puncture in the skin of half-grown fruit. We can only pick up the infected apples and roast them or soak them in poisonous water. We do well to grow our trees in the open, where bright sunshine makes it disagreeable for our rival.

Cicero ended all his speeches with *Delenda est Carthago* — "Carthage must be destroyed." I feel

about this way when I consider the last-named pest; the trypeta must be destroyed, only who is going to do it? I am afraid it is too much to ask of the ordinary farmer that he pick up all his summer-dropped apples and bury them so deep that the larvæ cannot get out, or burn them so that no larvæ can escape. But this battle is a very serious one, and everyone who lives in the country must think it out very clearly.

Each year is pretty sure to bring about a special trouble of its own — an insect or worm that can give us a lot of work to do, as well as a lot of thinking. Four years ago, without any warning, the pear psylla appeared in immense numbers all over our pear trees and lindens or basswoods. There were some of them on other trees, but mostly they were confined to those I have named. These hordes of sucking insects took the vitality out of the foliage to such an extent that many trees were defoliated, while not a few were killed entirely.

Then came in one of Nature's beautiful balances. The leaves were covered with a sweet exudation, from which our bees made a vast quantity of honey — perhaps not the very best in quality, but a fairly good and a large storage. I do not think I should have cared to eat it first hand from the leaves, but I relished it after the bees had worked it over.

At the same time the white-faced hornet began to build his paper nests all about our trees and porches. How he found out the sudden presence of a vast quantity of food I do not know, but he surely did.



Photograph by Elmer F. Reeves.

A GOOD HORSE IS YOUR BEST HIRED MAN

The hornets ate uncountable millions of the little insects. It was a poem altogether, and although we alone would have stood a poor chance against the silly psylla, with our insect allies we came off fairly well.

The worst pest, however, that I can remember, and the most awful fight that I was ever compelled to put up, was with the forest worm about ten years ago. This abominable pest comes about once in thirty-three years, three times in a century, or once in a generation of human beings. It marches over vast territories with astonishing speed and eats pretty nearly everything in its way. Gardens disappear; orchards are utterly defoliated; and a very large part of our lawn trees bared to the bone.

I am happy to be able to place right here the name of one tree that is largely exempt. The Norway maple has a milky juice that is acrid. It is so unpleasant to worms that even the forest worm skipped it. Yet the Norway maple is the grandest of our Acer family, growing faster than the sugar maple and with a foliage and a spread of foliage unequaled. You can bear this in mind when planting your streets or lawns. The forest worm is a caterpillar, about two inches in length, and a bushel to a tree would be a very small estimate.

You must fight with fire, circling your trees with wraps that will prevent their climbing after having thoroughly jarred them out of the tree, and you must not let up for church on Sunday. I am sure that

praying will do nothing with this worm. Then again you must be a little ahead in the fight, and if you would keep them out of your property you must meet them the other side of the fence. It is possible to be victorious even against such odds, for we saved our nine acres of berries and fruits, like an oasis in the desert.

There is a large class of sporadic rivals that we must discover for ourselves. They come at any time and there is no law about them. Most, however, come by periods, so that we may as well be ready beforehand. The May beetle has the habit of brooding in the ground and going through with some of his transformations there, emerging only every third year. That is, you will find a few May bugs, or June bugs as some call them, tumbling against your lamp shade any year; it is only every third year that they emerge in vast crowds.

Fortunately they are generally delayed by cold weather until most of the trees have their foliage pretty well developed and toughened. It is only the butternuts and the white ash that are still tender enough to furnish forage. These are sometimes badly cut up or stripped. Here again comes in one of Nature's handsome helps. When the beetles are in the ground, working slowly up to the surface, the moles will multiply astoundingly and you will find their tunnels everywhere. Do not kill them, for they are eating the larva that would otherwise become the destructive May bug.

The tent caterpillar comes irregularly, and if left to do its work undisturbed makes a terrible mess of it. He will ruin an orchard, not only for the present year, but will kill the trees. When this rival is to appear you will see a few advance couriers the year previous; attack them at once; burn out every nest as soon as it appears, and instead of having millions you will have only a few hundreds to watch for the critical year.

Scale bugs infest our gardens and orchards and must be looked for with considerable care, because some of them multiply with great rapidity and do their work with astonishing speed. The remedy is kerosene emulsion, or whale oil soap, or both combined, well sponged into the bark. A tree that has become badly devitalized may as well be cut down. The San José scale, which created terror all over the continent and did immense mischief in a dozen States, is now pretty well under control. Like all other scales it sucks the sap and poisons the wood of the tree at the same time.

The lime-sulphur mixture was the remedy that finally met the difficulty, as well as man could meet it; when there came in a fungus parasite, an insignificant thing to be counted as an ally for a human being, but so far as it has extended its work it has swept the enemy before it. In my Florida garden, where the scale had begun its ravages, the fungus completely routed it in a single year. How far North this friend will do its work I cannot say.

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Bear in mind always that the best protection for a tree against insect attack is to keep it in good growing health. This is particularly true of the aphidæ or lice, that they put in their appearance largely as scavengers, to clean up sickly foliage. A thrifty houseplant stands a good chance of resisting their attack and a well-kept and well-groomed apple tree suffers far less from them than one in which the juices are slow and the vitality low. Insignificant as the aphidæ are, their enormous numbers, the result of most astounding rapidity of multiplication, make them one of our most serious rivals. The hop louse appears on our plum trees and buckthorn hedges in spring, covering them with hordes of sucking and killing beggars, and in midsummer sends off a generation with wings to destroy the hop yards.

Professor Riley, United States entomologist, made as pretty a study as science ever achieved in working up this special pest. It is miraculous, the speed with which these lice will cover the orchards of a whole State, or of half a dozen States, and the worst of it is that Nature seems to go over to their side and help them out. The leaves curl up and make it nearly impossible to hit them with a spray. More than that, if you kill ten millions in the morning, before night there will be twenty millions more hatched out and every one at work sucking the life from the foliage. Professor Forbes estimates that a single mother in a single season will produce nine and a half quadrillions of young. It is hardly worth

while proving to him that he is two or three millions off the track either way.

The woolly aphis is one of the worst in the family, for it floats on the air like a bit of cotton, finding its lodgment in the joints of trees and creating a blister wherever it rests. One of these woolly creatures works just under the ground, creating galls on grapes. Nearly all deposit a honey dew, and this in some cases is utilized, as it is in the case of the psylla, by the bees.

Among the small friends that aid us in this fight with our small rivals we must count the lady beetles, or as the children call them "carriage bugs." Twice within the last ten years the apple crop has been nearly obliterated in half a dozen states by aphis, and in both cases the evil was mitigated by a parasitic help.

It was in the summer of 1864, or possibly 1865, that I first saw the potato beetle, then called the Colorado beetle, on its first march eastward. I was residing in Michigan, and the foul army came by tens of millions, marching straight ahead. When it came to an obstacle it never turned out, but simply climbed and went over, if it could — hills and hillocks, fences, and even houses and barns. Going eastward during midsummer, I found them at Niagara Falls — just arrived. Every floating chip on Lake Erie carried a stupid, vulgar, stinking beetle. Tens of thousands, of course, were drowned, but enough crossed the lakes and the rivers to make a start.

In two years more they were in every potato field of New York State, and by the third year they covered New England. Then we had a job. They ate all before them, and their countless progeny finished the work. The larvæ started from a mass of yellow and most disagreeable looking eggs, themselves more disagreeable, for a few years rendering our potato crop a negation. It was nearly as bad as the blight, and our agricultural colleges with their experiment stations were hardly then born. Science, however, stepped in and solved the problem. The pest is still moving on, and we can help move it by spraying every potato field thoroughly with arsenites, as we apply Bordeaux for the blight.

The Kansas grasshopper illustrates a very common rival of ours which has made history in Bible lands and all through the Orient, for this hopper is nothing else than the old time locust — the same that St. John ate and which constituted and still constitutes an article of diet for millions of people. I saw the edge of the battle field in Missouri, and that was enough to explain why the people deserted their homes and fled the country. Professor Johonnot and myself, standing twenty feet apart, shook our hats before us as we approached each other and caught a pint each of the quarter-grown insects. This was out of the main battle field and the hoppers were only fairly well at work.

When the Government sent Professor Riley to

investigate, it was well into the heart of the field. He reported that the clouds of insects reached from the earth beyond the height of human vision and that it was these rolling clouds that swept vegetation so completely out of existence that nothing seemed to be left but dust. Our meadows and corn fields in New England frequently suffer severely from the locust. Meanwhile the cricket helps the slug, doing its work a little more slyly around the roots of our lettuce and our strawberries.

I have already suggested that honey can be made on the trail of the aphidæ, and now let me call your attention to the fact that your grasshopper makes capital food for your hens. It is in this way that good comes out of evil and Nature brings compensation everywhere. Weeds really are not weeds, because they have in them a power of progress — only we must find out what they are good for. The beggar weed, which is our very best forage and hay plant in the South, was for a long time held to be the worst pest of the cotton field. Injurious animals are on the road forward, for the most part, and even the wolves have given us the collie dog.

We are ourselves creatures of progress, and generally that progress is speeded, if it is not measured, by our rivals — that is, when we have transformed them into allies. There is a fine passage in the Bible which tells us that the whole creation travails together, waiting for its redemption in man. The

chief end of man is to bring the apparently evil to a useful purpose and give to everything a chance for right character.

Curious, is it not? that our worst pests are the outlaws among our friends, the fellows who have organized for plunder, like the crows and the English sparrows. On the other hand our best friends are descendants of savage animals. Degeneration in bird or insect or animal is exactly like degeneration in human folk, the very worst thing to get on with. Bedbugs are the degenerate descendants of a very decent ancestor, while our most beautiful and useful birds are of saurian or serpent origin. All the difference was that the snakes went hissing through the grass, while the songsters went singing skyward.

It was well ordered of Nature that we should earn our bread by the sweat of the brow. It will not hurt us to have sharp rivalry. "Ye blackberry," says Poor Richard, "is a great help to us; for it hath power not only to give us sweet fruit, but to quicken patience and persistence; and one shall be the better for being sometimes pricked along the road of daily duties." All the same it is a fine thing for us to create thornless blackberries and seedless grapes and in other ways to improve the world. That is the best kind of a monument you can have.

And then how we Americans do waste. Last winter, when I went to my Florida home, the orange orchards were paved with golden globes. "Take all you want," said my neighbor, who owned three

hundred trees. The drought had loosened the fruit, and the sky, so lovably blue to us, was spoiling the crops. "Take care; do not step on them," you say involuntarily, for to a Northerner an orange is still sacred. The upshot was that we pressed twenty bushels into vinegar — better vinegar than that from apples. The bluejays hooted at us, while they gorged themselves on mulberries. I wonder if anyone really can live a simple life; at any rate we Yankees saved the oranges and made vinegar enough for forty years. Yet in all Florida a million bushels went to waste. This is but one item in the annual loss that we ought to know how to prevent. Wind and weather combine with our insect rivals to reduce our wages for work to a minimum; we must determine the maximum.

One must pluck victory from defeat. Make all your defective fruit, both apples and pears, into cider, and when your crop runs over the market demands, have a home cannery. Every country home of any size should have its own cider press and turn to value what most of the growers let waste. Grind no half-rotten stuff, wash off all dirt, and put in no water. Cider, genuine cider, is a drink for Jupiter, and real honest, clean, pure cider will bring a remunerative price.

I cannot close this chapter wisely without giving you formulas for two or three of the more important fungicides and insecticides. For Bordeaux mixture take three pounds copper sulphate, three pounds of

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quick lime or stone lime, dissolving in forty-five or fifty gallons of water. Dissolve the sulphate in hot water, dilute the lime when slaked with fifteen gallons of water; then unite, and the compound is ready for use. Keep the solutions separate unless you wish to use at once. For Paris green mixture dissolve about three pounds of quick lime and a single pound of Paris green in two hundred gallons of water. Use an excess of lime when spraying peach trees or plums.

Kerosene emulsion is made by dissolving half a pound of hard soap in a single gallon of boiling water; add two gallons of kerosene and churn with a small pump, until the whole is so thoroughly mixed as to constitute a soap. This emulsion should be kept on hand at all seasons and can be used for scale insects in winter, as well as for thrips and lice in summer.

You say I have altogether omitted discussion of the fight in the flower gardens. I have not, for kerosene emulsion is the one altogether important preventive and remedy for the enemies of the rose and of the borers and insects on the shrubbery. Keep a pail of this emulsion ready at all times. For roses and similar plants use about half a pint to a pail of water, and spray thoroughly. For house plants a spray of suds from sulpho-tobacco soap is useful; and about equally effective is a spray of water in which have been boiled tobacco stems; add water to make two gallons of liquid for every pound of tobacco

stems used. If you have an aggravated case of red spider or thrips, stir into the mixture one pound of whale oil soap for every fifty gallons.

I shall have something to say in my next chapter about flies and mosquitoes, for they are not altogether quite the only sinners in the world, although they certainly are sometimes very keen rivals of the human family. They render some sections uninhabitable and they carry dangerous bacteria which make many fevers more destructive. The most available method for combating them is to spray crude petroleum over the puddles and pools where mosquitoes breed; as for the house fly, if you will see to it that there is not a dirty stable within half a mile of you, you will see very few flies about your home. They breed in manure piles, which should never be allowed to accumulate and should always be disinfected.

Slop holes about a kitchen door and defective sewerage and puddles of standing water are a menace to the public health, as well as to private comfort and safety. By and by we shall prevent such things by social enactment. The destruction of flies and mosquitoes should be a neighborhood affair. If you live in the country you should not make your surroundings of a character that renders your home dangerous to the welfare of the community.

CHAPTER VII

OUR ALLIES

COOOPERATION is the law of life and of progress. This fact has brought about some very curious forms of coöperation. Think for a moment what a country family means. Man stands in the center of a group, gathered from all quarters of the world, crossed and recrossed by his skill, and constituting a solid alliance, without which neither human progress nor animal evolution could be secured.

Not only have our domestic animals become companions and friends, but we are just as dependent on them. A cow, uncared for, would starve during the first winter, but in turn our whole civilization depends upon the cow's milk. Other races are dependent on the goat, or the horse, or the reindeer, or even the dog. That seems to be the most perfect civilization that most completely recognizes animal friendship and most cordially apprehends the unity and interdependence of all life.

We are still a long way from having found the values of even our commonest animals and the simplest plants, but we are on the road — a road on which Burbank, with his scientific skill, is causing

redoubled speed. For the present evolution is giving us more new friends and opening the way most rapidly in the vegetable kingdom. Our agricultural colleges and experiment stations are doing some splendid work in the way of improving breeds of cattle or restoring lost breeds, yet it is among the cereals and the fruits more than among the meat producers that they are achieving triumphs.

You may note that, whether we will or no, our whole race is becoming more vegetarian in diet. So we shall find out, as we go on with this discussion, that while we have some wonderful friends in the stable and kennel, we have just as valuable and quite as important in the garden and orchard. We are not only eating less meat, but we shall eat less and less as the population increases and the vast cattle ranges are turned into little homesteads, each with its garden of vegetables, its egg producers, and its apples or its oranges. Every country home that is carved out in this way can produce, and must produce, nearly all its own food, besides giving a surplus to the general market. Our cities must melt away and spread out into a great suburbanism, where homes will not be piled on top of each other, but be gardenized in a few acres, homeful, sweet, wholesome, and the seat of a grand alliance, of coöperating animals and plants.

In my judgment, the noblest ally that we have to-day is the cow. I say this as a lover of milk; a bowl of sweet milk, half filled with bread and blackberries;

a bowl of sour milk or clabber; of Dutch cheese or cottage cheese, and all other cheese; and knowing that to young and old, to sick or well, the cow ministers more than do all other creatures. There is a lot of poetry as well as prose associated with the little Jersey, and she helps to make the small family a real family and a happy one. But better yet I like the old-fashioned cow — the quiet, clean, red old Mohawk Durham. Gentle as a lamb, you could milk her in the open field or ride her to pasture.

A Jersey is a baby — always, and don't forget it when you buy the family cow. She will need special nursing and rather better care than the ordinary family will give. An Ayrshire is Scotch to the backbone, and she will have her Highland fling in the pasture and sometimes in the stables. She will give a pailful of milk every time, and twelve pounds of butter a week on decent feed; but give me the cow of quiet habits, hardy, kindly, steady in her milk flow for nine months of the year and easily kept, without studying balanced rations in bureau bulletins.

To keep a cow on the old style of farming required about ten acres, for in a pasture of three or four acres she would tramp and foul two-thirds of her feed, while by the modern system of stabling and feeding with cut feed two acres are abundant. If I had just a three-acre lot, I would put exactly two acres to berries and vegetables; then put a fringe of apple trees, with pears and plums and cherries, around the whole of it, saving half an acre for si-

lage and half an acre for alfalfa and corn fodder. All the clippings of the orchard and lawns or yards count in for cow feed, and when these are kept up, as they can be on the intensive system, they will go a long way to furnish food through the whole summer.

Half an acre of alfalfa will furnish three heavy cuttings of either summer feed or hay. Corn fodder, carefully drilled and hoed and standing eight feet high before cut, will furnish an astounding weight of food. Every ounce of it will be eaten if only it is fed judiciously.

What is true of the cow is equally true of a horse. I asked a drayman how much his horse cost him for feed annually. He replied: "My yard is all alfalfa, not much more than half an acre, but it gives me about all the hay I need for six months." In the Southern States we resort to cassava for horses or cows. Cut up half a peck of this root and sprinkle it with meal or oats and you have a splendid ration. One hill of cassava is equal to five or six hills of corn.

We need to work from this time on more directly for bovine intelligence. The cow has a deal of latent brain power, so far applied only to getting food and rearing calves. Raising an Ayrshire yearling some years ago, I found her as capable of comprehending a joke as a collie dog. She was literally full of fun.

Forty fowls had their roost in reach of her range, and when I would go down to pet her she would

look me in the eye with a sort of Scotch twinkle, and then dash to the roost and scrape the whole row of hens off with a rush and a flutter.

I may be a Nature fakir, but I believe that every one of our domesticated animals has begun its rational development and that it is capable of becoming a companion for intelligent human beings. It will pay to bring them forward as fast as possible. I never yet saw a cow or horse that, with right training and treatment, could not help me out of difficulties. Even an unruly cow will stand to be milked more readily by anyone who sings or whistles.

As for the horse, it really is a part of any well-organized family and deserves every bit of petting that it ever gets. Secretary Wilson is the one American who has done most, since Thomas Jefferson, for the development as well as the conservation of American resources, but he is doing nothing better than trying to rehabilitate the Morgan horse. I owned a Morgan once, and she was more than a friend. She always called me when she wanted anything, and on more than one occasion she saved me from serious trouble.

Going up a very steep hill, the coupling broke and dropped the shafts against her legs. She had to hold that buggy with great care, or I, with my wife and baby, would have been tumbled over a dangerous precipice. She braced herself instantly, looked back, and whinnied. I spoke to her as I would to a human being, asking her help, and if

ever any two persons worked together, we two coöperated to the full in getting that buggy to the top of the hill, where the break could be mended.

No mischief could occur about the barn, among the calves and other animals, without this noble animal calling me with unremitting energy, and when I appeared she would whinny her satisfaction and return to her diet. The Morgan was as near a perfect horse as America produced; has speed enough, thoroughly hardy and healthy, but, with all the rest, as intelligent as brave and enduring. At any rate, when you get your family horse look out for something in the way of capacity for intelligence.

Asking an expert in horses to help me judge of an animal, he stood directly in front of her, looked her in the eye, talked with her as with a human being, then turned to me and said, "Buy her, for she knows too much to try to fool you." When you get your horse treat her intelligently. If she has a trick, you can generally persuade her away from it with kindness. However, a narrow-headed, small-brained, pig-eyed horse is about the meanest thing that ever man had to deal with. If the man is of the same sort, you will get a match that explains some of our country homes.

I have mentioned the collie dog. I wish every one of you could have one of these wonderfully wise and beautiful companions. Here again it is the capacity for reasoning that makes the specific charm. I do not forget some of the old-fashioned mongrels,

the mixtures of spaniels and bulldogs that gave my boyhood many happy hours. With one of these I used to skirt the hillsides and spend the whole day in the blackberry glens. At lunch time he came for his share of the cookies and drawing his lips carefully up, he would pick off and eat blackberries as fast as I could with my fingers.

Yet of all animals in America I think we are incurably breeding more incurably worthless dogs than of all other animals put together. If I were going to the country to make a home for the first time, I would surely have nothing of this sort about me. Three-fourths of the whole canine stock should be obliterated — especially the town dogs that have no reason for living except to eat the children's bread. They constitute the waste material left by Nature in her efforts to create something worth while. When you get the mean all sifted out of animal life and the true, pure, honest and brave all worked in, you have a dog, and when you have all the good worked out and all the contemptible ingrained, you still have a dog.

I am specially fond of good cats, and I have known a few that were really honest and noble. One of them roused a neighbor's family and saved them from their burning house. White Face was my friend in college days and he could almost talk in English — better at least than I could in Latin. He would sometimes ask me if he might play with the chickens, and when I gave permission, he would gently

roll the fluffy things over, very gently, then he would come back to me purring satisfaction. He would never taste his saucer of milk until his mate was on hand for a full share.

But what is one to do about it? I think the cat was never known that could be entirely cured of destroying birds? It goes too far back in their heredity — clear back to the beginning of the cat stock. I have already told how I house my cats during the whole season, giving them a four-room palace, but no freedom to range while the nestlings are unfledged. I advise you to shut up your cats, or stop keeping them.

Birds we must have, not only to make the country countrified, not only for the company and the song, but because our crops are dependent so largely upon their help. The singers not only sing, but they eat vast quantities of insects and the seeds of noxious weeds are devoured by the ton. So much of this help do they extend that we can afford to feed them as regularly and systematically as we do the cow and horse. It is those who do nothing of this sort who suffer most from their depredations.

I knew a man who advocated killing robins to save the cherries. I early learned a better way: plant more; plant enough for all of us. When it comes to ripe cherries I cover about two-thirds of my trees with mosquito nettings and say to the cat-birds and thrushes, "You own the rest." I do not give them these; I only recognize the fact that they

belong fairly to my partners. Catbirds are wise enough soon to learn which are their trees; as for robin redbreast, he is never particular. In Florida the mocking bird soon learns to keep close to us and pick up the pieces.

Say what you will, birds never take any more than enough for sustenance; they are not wasteful. If you will plant a hedge of Tartarian honeysuckle and then a wind-break of mountain ash, with wild cherries alternating, you will find not only a beautiful display of flowers and berries, but the birds will go there instead of dining in your garden. Where you have large fields of raspberries and currants, bird intrusion is not noticeable.

Coax your neighbors to plant — giving them trees and bushes. Plant the glens and the woods and the forest edges with bird feed. My father went still further, for he would graft the wild cherry trees with choice sorts, "to give the birds better cherries." One of our best authorities notes the mulberry as a good tree to grow wild, or along the streets, to call the birds from cultivated fruits.

Professor Beal, of the Michigan Agricultural College, specifies among other trees and bushes, the shadberry, and for winter food he would have on hand the bittersweet, the pokeberry, the bayberry, the hackberry, and plenty of mountain-ash trees. All of these are easily found from New England to the Pacific coast, and I would lay special emphasis on growing more mountain-ash trees. A single tree

will feed flock after flock of birds of passage, all through the later autumn.

This matter of winter food must not be passed by lightly, for we can easily induce a large number of birds to spend the coldest months around our Northern homes. When they are not picking at the bones which we hang for them outside our windows, they will destroy myriads of the eggs of vermin, hidden under the bark of our fruit trees.

A very careful observer tells us that a single pair of house wrens will dispose of at least one thousand insects every day and that other birds serve us in about the same ratio. I want you to see this thing in its clearest light, as a matter of domestic economy to cultivate bird friendship. We must gather them about us and protect them, make our homes as pleasant to them as to ourselves. Any effort in this direction will be quickly appreciated, and the word will pass around among the tribes, until the wilder sorts come in and domesticate themselves.

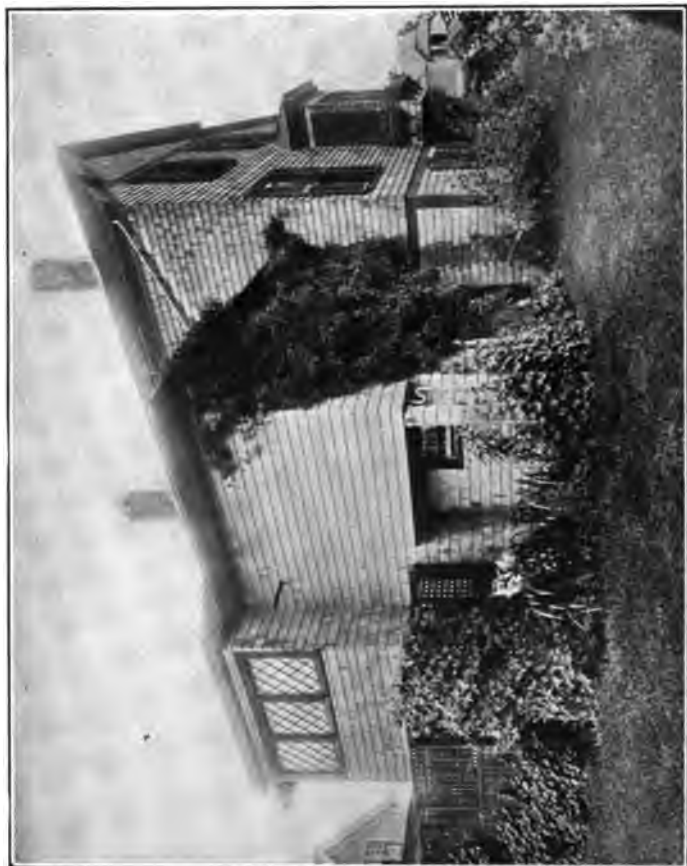
My Clinton home is populous with not only robins and catbirds, but grosbeaks and indigo birds, and purple finches and tanagers, and of late the wood thrush and the Wilson's thrush have come to nest close by my house — singing in the shrubbery, with those long, silvery, echoing notes that a few years ago were heard only from the distant forest.

There are, however, two sides to this question, and I have fairly developed the opposite side in my chapter on Our Rivals. Some of my friends insist that

the red squirrel and the crow and the hawk can also be made allies, but when I find a crow on the edge of a robin's nest, with one of the young birds in his beak, I have no inclination to cultivate his acquaintance. The red squirrel is even worse, and when I hear an outcry among my bluebirds and tanagers I am almost certain that one of these wicked whisking beauties is somewhere among my trees. Say what you will for him, he lacks a conscience, lives for himself alone, and preys on anything that he can eat. He makes no friendships and recognizes no alliances.

This is true also of the English sparrow, so far as I can observe. A robin has friends and so have all the song birds. They will join forces when necessary and carry on war together. You never saw any other bird aid a crow, or help a hawk, or express any sympathy for an English sparrow, but you may easily see a flock of half a dozen sorts of birds, led by a king bird, in hot chase after a marauding crow.

Some birds, I agree, stand about midway and can hardly be reckoned as strictly allies or strictly rivals. In Florida I am specially interested in the shrike, a handsomely built, natty fellow, always ready to assert himself in a scrimmage with other birds. He comes close to you, looks you in the eye from the top of a persimmon bush, and suddenly jumps for a grasshopper or a grub. Nothing escapes his keen vision, and whatever he does not need for immediate



Photograph by Jessie Turbox Beale.

GIVE THE VINES AND SHRUBBERY A CHANCE AT YOUR HOUSE



use he spikes on a thorn bush or an orange tree, or makes use of the barbs of your wire fence. In this way I find grasshoppers and grubs and crickets and even whole frogs among his storages — grubs as big as your thumb, and I am grateful for his help in my garden. But that he breaks up some birds' nests I cannot deny.

In the North I feel somewhat the same way about the owl; a screechy affair, associated with all sorts of superstitious notions and not unacquainted with chicken flesh. Yet I believe the owls, as a rule, are fairly classed as helpers, for there is a certain class of marauding vermin at night that only the owl can spy out and destroy. The government bulletins insist that some of the hawks should be encouraged, for they surely do catch mice and occasionally may be found in some honest occupation, but I have never met a hawk that at the time was not up to mischief — either striking his ugly claws into my chickens, or sailing around the sky in geometric circles just over the chicken yard.

I like hens; I do not wish to live where I cannot hear roosters crowing at daybreak. In fact, they crow long before that, only most people do not know it. Just as the morning curtain is being drawn slowly up it is fine to hear "Good morning" called out from a whole valley full of farmyards. It is a curious habit that chanticleer has, but it is full of good cheer and associated with pleasant memories for many of us.

About one hen out of every flock of thirty will display some sort of unusual intelligence, if you give her a chance. One of these wise ones, of Plymouth Rock lineage, adopted me in my strolls about the orchard and garden, walking by my side everywhere and continually prattling in a language of mixed desire and affection. She knew right well that my pockets frequently held corn, and if I sat down on a stone she ate from my hands, eloquently expressing her gratitude.

As egg producer the hen has come to be one of the greatest factors in American economics. As cattle ranges disappear, our food is essentially narrowed and the hencoop will be the only relief for the great mass of country home-makers. Perhaps we may add to the coop a rabbit warren, and so while increasing our meat supply, get rid of a troublesome pest. Anyone can have a supply of eggs at small cost, but the present price is revolutionary.

As for a pig, why not, if one gives him a chance to keep himself clean? A hog with half a chance is cleaner than a cow — with equal chances. Professor Shaler was a specially good student of Nature, and he insisted that our pigs are among the most intelligent of our domestic animals. I have lived for a few years among the razorbacks of Florida, and I assure you that for keeping posted on all horticultural matters he is the beat. He knows every sweet-potato patch within five miles of his home, and he can live well with his family where human folk will starve.

Alas, for the rarity of human charity, we have by law at last abolished him! In Florida he will henceforth have no more rights than common folk.

Around the farmhouse there is always a certain measure of waste, and it is the judicious use of this waste that makes the difference between success and failure. Suppose it to be divided in this way: to fatten one pig, to feed twenty hens, and a warren of rabbits, while the cow gets a pail of slops at night — making a grand return in the way of milk for the pig and for the hens. A pan of sour milk is one of the luxuries for the chicken yard.

Bees always call out my enthusiasm, because from fifteen hives I am accustomed to take up nearly a thousand pounds of honey in a year. This varies somewhat according to the flora of the year, but it is always a fine addition to the product of the farm or country home. You can easily use a hundred pounds in your family, taking the less perfect cakes, while you sell five or six hundred pounds or more at a welcome profit.

However, one must remember that as with hens it is possible to have too many. Fifteen or twenty hens are enough for a common country home of a few acres, and from ten to twenty hives of bees must be the limit for the same homestead. If you undertake one hundred hives, you must make a specialty of bee-keeping and bee-feeding. What you want is just about that number of colonies that can be fed from your own raspberries and lindens and mountain ash

and apple blossoms, and the golden rods along the creeks, adding alfalfa wherever it can be found on the adjacent farms.

If you are a grower of small fruits, especially raspberries, you may count that the bees will make great use of your garden. A grove of lindens or basswoods should be planted somewhere about every large farm, and a few trees should be worked in on a small place. It is a grand street tree, and we might just as well have a vast amount of honey-producing flowers as well as shade from our highways.

The bee has a marked degree of attachment for some persons and hate for others. I have a hired man who cannot go near the hives, and the bees will even hunt him out when far away in the fields and will chase him flying to shelter. When my father had a swarm to deliver I have seen him let them light all over his hand and arm, up to his shoulder; then after carrying them for a quarter of a mile, he laughingly brushed them off into a hive. They were fond of him. They are not fond of me — not at least to that extent.

This passionate liking and hating runs through the whole animal kingdom and must be taken account of while seeking out allies. Dogs never go near some people. I have seen a cat become so attached to a human friend that after separation it mourned for weeks.

Just how far we can go in developing this in-

telligence, or even letting it loose in speech, I do not know, but there surely is a great field before us. Our versatile friend, John Burroughs, has argued strongly, almost vehemently, that animals cannot reason. My own experience, running over more than half a hundred years of joyous companionship, convinces me that all our domestic animals can think and think to a purpose.

The story of our allies is not by any means told by recounting the domestic animals that live with us. The French town authorities post village bulletin boards, for public instruction. One of these reads: "Hedgehog; lives upon mice, snails, and wireworms — do not kill a hedgehog. Toad; helps agriculture, killing twenty to thirty insects every hour. Do not kill a toad. Cockchafer; deadly enemy to the farmer; lays one hundred eggs at a time. Kill the cockchafer." It would be a good idea for our own government to post bulletins of this sort, instead of printing so many for circulation.

In the South most of the snakes are of great value, and that is relatively true everywhere. The black snake, a handsome fellow, is estimated to be worth ten dollars a year to destroy mice and gophers. The bull snake and garter snake destroy insects and rodents, without themselves hurting the garden. In my Clinton ground we have so long protected the little garter snake that he suns himself on the compost piles without fearing us at all. Why not? Why

carry a spite, because a serpent is said to have tempted Eve? Was it not a fair match? Poisonous snakes are nearly as rare as those that talk.

One of Darwin's most interesting essays concerns the value of the angleworm. It serves to plow up the farmer's soil, reaching a depth that his best subsoilers cannot touch. It is one of Nature's prettiest methods of laughing at our inventions. The worms aerate the soil and make room for both water and roots. In Florida the gopher, which is a ground squirrel and a pest in most ways, does a vast amount of this subsoiling. I inquire at his mound concerning what lies underneath that which is reached by my plowshare. Getting the air into the soil is, after all, our most important agricultural work.

Overhead and everywhere about the Southern States, you see a bird of the condor sort, a distressfully unfinished creature, that the laws forbid you to kill. He is a most important public scavenger and invaluable where range cattle are tolerated and not a few cows die in their wild pasturage. Only for this turkey buzzard the air would be tainted all the year through.

Do not kill the lady beetles, for the whole class of them do nothing else but work for your advantage. Boys call them carriage bugs and seldom know their importance in the orchard. Daddy longlegs is another of our friends, which we should leave to his beneficent work of destroying scale and other insects.

Bad name as the house fly carries, the mosquito has a worse, and it is the fashion just now to imagine that we have solved all our hygienic difficulties by publishing recipes for killing these pests. Yet it is doubtful if the world could be inhabited long by human beings without these insects to transform decay into living matter. Their uncountable millions are busy at this service; their infernal thousands have degenerated into bloodsuckers and poison carriers. I should hardly wish to call them allies, but the good done by them must not be forgotten.

The house fly breeds almost wholly in our stables, and we can forestall this by keeping clean stables and barnyards. A dirty stable near a house breeds such swarms as are intolerable, and a high wind for two or three days will carry a cloud of these flies half a mile. Mosquitoes enough to make a whole neighborhood miserable will breed in a single sink hole in a single day. Kerosene sprinkled about our damp places once a week and sprayed over our stable walls daily will prevent the development of both flies and mosquitoes.

There is no reason nor excuse for neglecting the comfort of our domestic animals. A dirty stable becomes a menace to the community as well as the household and is an insult to "Him in whom we live and move and have our being." It is an element of degeneration — debasing animals and owners together. I like better the Dutch plan of costlier stables and cheaper houses.

It is hardly just that we lay so much emphasis on animal loyalty and forget what the plant world has done and is doing for us and with us. I hold an apple in my hand, gold on one side and crimson blushes on the other. I know that inside it is a mass of cells, each filled with nectar fit for a Jovian assembly. Was it an apple that caused the Trojan war? Well it might, for Nature, in tens of millions of years, has brought about nothing nobler than a Northern Spy — unless it be a Golden Pippin, or a Jonathan, or a King David. Nothing has entered more into our human progress than the apple and its cousins, the pear and the cherry. Now we have also the orange, and it will soon be everybody's fruit, and the persimmon, so long in disgrace, will very shortly become the third in the trinity.

This business of coöperation with animals and birds and plants is not half understood. Except for four families of plants, mammals, including man, could not continue to exist, certainly could not make progressive evolution. These four are the Rose, the Cereal, the Solanum, and the Palm. From the first of these we get nearly all our common fruits, from apples to strawberries; from the second we get rye and wheat for our bread, rice and oats and corn for both ourselves and our domestic animals; from the third we get the greatest of all esculent roots, the potato, as well as the tomato and tobacco; while from the palm family we have not less than one thousand varieties of useful fruits and fibers.

This does not end the story, however, for without the trees and the flowers of the Rose and the Palm families we should lose our poetry as surely as our food. It is a wonderful coöperation, looked at from any standpoint we please. With intelligent and human leadership on our part, the animal and the vegetable kingdoms alike become tributary to our welfare.

CHAPTER VIII

IN OUR ORCHARDS

WORDS grow as well as things. The word orchard was originally hortyard, that is horticulture yard, and at first it only referred to herbs, for our early Saxon ancestors knew no more about apple yards than they did about orange yards. The garden yard has gradually become a tree yard, including apples, pears, plums, and cherries, and similar fruits, in the North; in the South oranges, grapefruit, figs, loquats, and many other new sorts.

What the orchard will be five hundred or a thousand years hence who can tell? We are almost certain to get the orange, by selection, hardy enough to fruit in Massachusetts, while we are already getting apples pretty well down toward the tropics. This does not cover the whole story, for we are surely going to have a lot of new fruits, some of them hunted up from the wilds of Nature and others created by the Burbanks and Munsons.

It took Nature thousands of years to get the glorious apple tree made up from a little potentilla origin, swinging with pippins and greenings, and a free gift to every country home. Sweetest memories of

life cluster about the apple orchards. It is a wonderful tree standing alone on the hillside, haunted by boys and a favorite place for robins' nests, but an orchard of apple trees, standing in long rows all over the slope that looks down into a valley full of homes is a gift surpassing all other for human ownership.

Peach trees bear only half a dozen good crops, but the apple orchard is good for a hundred years. I have two trees out of an orchard that was planted one hundred and twenty years ago, and they are still bearing their annual loads of good will. I do not doubt but that, with rational care and apple sense given to an orchard through its whole life, it might be in bearing for a full two hundred years — maybe longer. The pear is even more enduring than the apple, for there are still growing some old Flemish pears, near Monroe, Michigan, that were planted before Philadelphia was founded by William Penn.

Select apples have been selling for five dollars a barrel in the orchard. In the spring of 1908 they went up to ten dollars in the New York markets. The increase of consumption is really enormous and accounts in some degree for the swollen prices, but we cannot escape the conviction that every country home-maker should grow his own apples and have a small surplus for market. When this is done the price will be a just one for both producer and consumer.

We have now catalogued over two thousand sorts of apples that are worth discussing. I grow eighty

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of these, and a good market requires about ten or twenty for complete succession. Your little home lot will be complete with a dozen varieties, reaching through the whole season. With these, carefully studied as to planting, pruning, and storing, you will have a wonderful addition to your food and a surplus for sale.

It is the diameter and not the height that determines the value of a young apple tree. For planting it should stand about five or six feet after it is dug and four or five feet after planting. No possible price should tempt you to plant a lot of trees no larger around than your finger. If such trees are ever received, cut them down within three or four inches of the scion; then let new shoots start, and in this way you can make a new trunk, possibly one that will be worth the while.

Having got your trees, take them from the box or bale at once and trim them to very nearly bare poles. If you have a stream near by, it will do no harm to immerse the whole tree for an hour or more. It is better to make a puddle in which the roots may lie over night, or for a few hours. If not to be planted very speedily, let the trees be heeled in, that is the roots and part of the trunks buried in moist, but by no means wet, soil. These dormant trees must not be so rapidly supplied with water as to start root growth before they are set in the orchard. It is sometimes advisable to buy your trees in the

fall, heel them in over winter, and plant them just as soon as the ground is in good condition in the spring.

The choice between spring and fall for planting depends upon the nature of your soil. If sticky clay, liable to be sodden or lumpy, I would plant in the spring, but not until the fields are in good condition. You might as well burn a tree as to plant it in mud. If planted in the autumn, stake the trees and tie them with basting or coarse twine so firmly that they cannot be twisted about by the winter winds. What we want is an easy and quick start of the buds, but we want first a good start of the root system.

It hardly needs to be said that nearly all apple trees prefer clay soil to sand, yet a few sorts, like the Winesap and Jonathan, prefer light soils. The size of the apple and the quality alike depend upon having the soil that suits, together with plenty of sunshine. I advise you to plant your apple trees where they can have the best of your acres and plenty of room.

Three things are of vital importance at this point. The first is good drainage. In most of our clay soils I would use up the stones by creating ditches every fifty feet. If tile drains are used, they can be easily arranged for irrigation as well as drainage. Dry tillage means only a way of preventing water from evaporating and of gathering water from the air without rain. This is done by keeping the sur-

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face stirred daily, a process that creates a soil stratum which will absorb moisture from the air, while it does not transmit it from below.

The second point to consider is that there is no better way of killing fruit trees than to put barnyard manure around the roots. You may top dress with some of this material, but beware about using it in the hole that you have dug. Do not get in a hurry to force growth. If you can get good roots during the first year or two, you can get along with very little top growth.

The third point in planting is to mulch your trees, every one of them, just as soon as planted. This mulch may be made of any porous stuff that you happen to have about, coal ashes or tan bark or weeds or autumn leaves — anything but material that mice will be likely to bed in. Coal ashes, on the whole, are the best material that we have handy, and it is also good when thrown upon the soil and mixed in, lightening the heavy clay which dominates in many apple sections. I have seen city gardens made very productive by working coal ashes into the solid soil. Weeds cannot be more efficiently set on the road to being useful than as mulch. Make the mulch at least three or four inches thick, and if of weeds or of stuff that will blow away, toss a few shovelfull of soil on top.

In the South we are obliged to mulch very heavily against the heat. You will find that I am not laying too much stress on this point, for if a dry time sets

in after your planting, you will scarcely keep your trees alive without daily watering, and even this will not compensate for the lack of protection to the roots.

Trimming large limbs from any tree is the beginning of death, and it should never be practiced unless absolutely necessary. To avoid this, we want to know when we plant just about how high up we will need the limbs to be removed when the tree is grown. An orchard tree, as a rule, should be headed rather low than rather high. The old-fashioned apple tree was grafted at eight or ten feet, on seedling stock; as a consequence, most of the trees were high to the first limbs and it took a forty-foot ladder to reach the top.

Set your apple trees nearly or quite forty feet apart, even forty-five, if planting some of the spreading varieties, like Spitzenburg, Northern Spy, and Greening. If you are setting only a few trees for a quiet home, they may stand a little closer. The intent must be not to let the trees, when full grown, interlock, or very much shade each other, for if this occurs the fruit is robbed of its sunshine and light, never becoming richly sweet and always liable to be affected by fungus. A Rhode Island Greening grown in the shade is hardly fit for cider, but grown in the sun is full of gold and sweetness. A Pound Sweet standing in a close orchard is an utterly worthless apple, but a Pound Sweet grown on an open lawn is delicious.

Other fruit trees in the orchard can be spaced according to your judgment; peaches will need fifteen feet and pears from fifteen to twenty-five, but a few varieties demand about as much space as apple trees. The Seckel is one of the small growers, the Bartlett a medium, while the Rostiezer is liable to spread its limbs quite widely. Plums are fond of company, and most varieties do better set rather close together. It is a short-lived tree as a rule and needs very frequent renewing. The new Burbank hybrids and the Japanese sorts require about fifteen feet. Cherries take about the same space, but the sweet cherries will do better if given twenty feet.

It is a secret, not known by even most orchardists, that if trees are headed very low they will fruit earlier than if headed higher. This, of course, prevents plowing and cultivating an orchard, but it gives you quick returns for your money. A pear tree headed six or eight feet high will demand eight or ten years to do much in the way of fruit-bearing, but if headed three or four feet from the ground it will give you good returns in three years. Some of the apples will respond quite liberally in the same way. Peaches should always be headed low and plums will be none the worse for it.

There are two ways whereby a very small country home may increase its varieties of fruit without crowding. In the first place, graft two or three varieties on the same tree; for that matter you may have every large limb a distinct sort — but this I

do not recommend. You may at least have your Astrachan and your King David on the same stock, also the Spitzenburg and Greening. Select sorts that have similar style of growth. Planting dwarf trees is another way of getting a good supply of fruit from a small area. Dwarf apples make very beautiful trees, giving good fruit, and are easily picked.

If you happen to have bought an old orchard, or the relics of one, do not be too hasty in cutting it down. A little care in the removal of dead wood and suckers will often restore an old tree to considerable vigor and capacity for bearing.

Now about trimming; a good deal about this will come in at another place, and all I intend to say now is that, from the moment the tree is set in the ground, it will want watching and guidance. Most of the early trimming, that is, for a year or two, can be done with the thumb nail, or a small pocket knife. Do not let any buds start to grow which will not place a limb just where you want it, and you want the limbs, of course, to be fairly distributed about the trunk. When you cut back a shoot that you wish to grow farther, leave the last bud pointing in the direction you wish it to grow. If two buds start close together, remove the weaker one. In the fall, after growth has stopped, cut back the strong shoots about one-half, leaving the last bud as I directed — that is, pointing outward.

Trees are exactly like animals about feeding; they must have enough to eat or they will lose their ability

to produce fruit of the best sort. A half-starved tree gives you half-developed fruit; the wood becomes knobby and the bark adheres too tightly. However, judgment must be used in feeding, or plant dyspepsia sets in. Very few trees will endure rank manure, and a great many of them protest against barn manure at all. Some of them prefer muck and lime. Compost all the food, then place it about the roots and later plow it under. The use of lime is not as a direct manurial agent, but to help decompose coarse food and make it fit for the plant to receive and digest.

With my present experience, if I were going into the country to make a home, I should want the following list of apples: for early use I would select the Red Astrachan, Primate, Yellow Transparent, and Williams Favorite; for later ripening through the fall months I would not feel contented without Sherwood's Favorite, Wealthy, Gravenstein, Pound Sweet, and Maiden's Blush; then for winter I should make sure of Baldwin, Danchy's Sweet, Delicious, Hubbardston, McIntosh, Mother, Northern Spy, Rhode Island Greening, Stayman's Winesap, Wagener, and King David; Jonathan and Grimes Golden I add for special localities, like western Virginia and Colorado, where they are ideal. King and Newtown Pippin are superb but too exacting in their demands for general culture.

Now let me reduce this list to fit it to a very small home. Take Astrachan and Transparent for one



Photograph by Perch.

TEACH THE CHILDREN TO WORK WITH HANDS AND BRAIN

tree, Gravenstein and Wealthy for a second, and Sherwood's Favorite with Maiden's Blush for a third. McIntosh should have a whole tree, Hubbardston another, and Northern Spy a third. Winesap and Wagener make the seventh tree, Pound Sweet and Danchy Sweet the eight, and then give the ninth and tenth to King David and Shiawassie Beauty. This is by no means a complete list of apples, nor does it include what I myself call indispensables. I am lonesome without the old-fashioned Spitzenburg, the Rhode Island Greening, and the Swaar. Only do not let anybody persuade you to plant for a cosy home use any such apples as Ben Davis.

In my book on Orchards I gave a list of apples for a delicate stomach. I am inclined to modify that list very decidedly, but I would put in Mother, Wismer's Dessert, Delicious, Scott's Winter, and Princess Louise. Some of these I do not put in my recommended list, because they are subject to diseases that the ordinary grower will hardly combat successfully. A list of apples nearly immune to insect attack, the most easily kept healthy, and good bearers would be this: Wealthy, Seeknofurther, Shiawassie Beauty, Hubbardston, Maiden's Blush, Stayman's Winesap, and King David.

It is our good fortune to be able to secure a list of pears that will cover a full season, almost as surely as apples. A list of first-class varieties would be Rostiezer, Bartlett, Tyson, Onondaga, Sheldon, Seckel, Anjou, Lawrence, adding Patrick Barry for

very late. This leaves out Clapp's Favorite, which should be added if you will only make sure to pick it early. Those families who can plant only four or five trees should take Clapp's Favorite and Bartlett grafted together, Sheldon, Seckel, Anjou and Lawrence grafted together, and Patrick Barry. Reduce this to three trees and you might take Bartlett, Sheldon, and Anjou.

I believe in the plum as a wonderful fruit, most delicious and most wholesome. It is great for cooking, for canning, and for eating out of hand. Of the old fashioned or European sorts we must have Green Gage, Peter's Yellow Gage, Coe's Golden Drop, Diamond, Shropshire Damson, Fellenburg Prune, and for show as well as for quality the Pond.

There are two preëminent varieties that I shall not advise you to plant, simply because they are so given to black knot and suckering — I refer to Bleeker or Lombard and Magnum Bonum. Both of these are hopelessly subject to disease, but as we can easily have them on their own roots, one may cut down a diseased tree and renew it.

If you have but one plum take the Green Gage, which is the very essence of delicious flavor, also making a capital preserve. Shropshire Damson can be secured on its own roots and is the ideal plum for cooking. Monarch is a new sort of superb quality, ripening in October, and very late comes Grand Duke, one of the first of all plums — frequently hanging in excellent condition into the first snow.

Fellenburg Prune is of the highest quality and very prolific of large sized plums — for prune and plum are really one.

Almost everyone who knows anything about plums at all has become more or less acquainted with the creations of Mr. Burbank. These are hybrids of our native sorts with the Japanese. The best of these hybrids are Shiro, Red June, Climax, Maynard, Sultan and Gold. I have all of these growing to perfection, with the exception of Sultan, which does not prove quite hardy in New York. America is in some ways still better than any of these, and very early, only, if not severely thinned, the quality of the plum is positively poor. Abundance and Burbank are two importations, both of them quite early and of about equal value. They should both be picked from the tree as they begin to color and allowed to ripen in the store room.

I do not wonder that the Japanese worship the cherry. Spring would hardly be spring without the bursting open of the delicate white flowers in the cherry garden. You can divide them into two classes, the sweet and the sour. The sour cherries are very much alike, only some of them are a little larger and more meaty. The best of all is perhaps Montmorency, or possibly Baldwin, or Suda Hardy. These three you might easily find room for.

Of the sweet cherries Gov. Wood, Windsor, Napoleon, and Dikeman are enough for a small home. Black Tartarian, however, is a magnificent affair if

you have room for it, and so is the Rockport. But for my own choice I prefer of all cherries the May Duke, coming into a class about half way between the sweet and the sour. The trees like to stand about fifteen feet high, are almost as hardy as the sour sorts, and the quality when dead ripe is absolutely satisfactory — nothing more can be asked for.

I would grow peach trees for the flowers, if there were no such wonderful things as peaches. I have them in New York State, in Michigan, and am now planting them in Florida. My colored friend says, "Well, suh, Mr. Powell, seems to me the peach is about all good things in one. It is pretty for sartin, like the sunset, and it is good for a Christian, and it is all right — only it ain't satisfyin'. I can fill yup with melyon, but I can't fill yup with peaches." I think he hits the mark exactly. The peach never surfeits; that is good peaches do not.

I would plant by preference Crosby, Champion, Alton, Admiral Dewey, and Stump the World. In Florida we have to make our choice from another set of peaches. We plant the Victor, the Triumph, the Mayflower, the Champion, the Jewell, and others from the Southern China stock.

Spraying in the orchard does not differ very much when applied to the different sorts of fruit. If the arsenites and Bordeaux mixture are used together, they cover the whole problem of insects and fungi, but if freely applied to plums and cherries and

peaches, lime must be added to prevent damage to the trees.

The chief difficulties that we have in the apple orchard are with codling moth and trypeta fly; for the former we spray with arsenites, but, alas, for the latter we have no remedy but to keep the orchard open to sun and air. Sheep pastures are almost immune from this pest. The apple aphid or louse is an occasional pest, covering whole states and almost beyond our power of control. The best remedy is to encourage the white-faced hornets (the paper builders) who devour millions of the insects.

At all times, but especially when the orchard is infested with lice, there is great danger of too many blossoms setting fruit. The result will be clusters or clumps of small and unsalable apples. The remedy is to go over the trees, thinning out the smaller fruit, and then go over again, until at least three-fourths of the stock is removed. The result will be large, fine apples, where your neighbors have none worth the picking. Very few have patience to practice this art in apple growing, and as a consequence they will occasionally lose their whole crop. The thinning is done with a wire crook attached to the end of a short pole.

Borers are of several kinds and infest apples, peaches, quinces, and sometimes plums. They work generally at the base of the tree and just at the edge of the soil. The simple remedy is to cut them out

with a sharp pointed knife, or follow them through their tracks with a flexible wire, until crushed. Then pile around the tree a good supply of coal ashes. This material serves at once for mulch and to prevent the easy working of the moths and beetles. As for the nest-making worms or caterpillars, any one with common sense and energy can manage them. Wind a bunch of cotton around the end of a pole, saturate it with kerosene, set it on fire and burn them out. Persistency will keep the upper hand of any foe of this sort.

Plums you must jar with a pole padded at the end, so as not to bruise the tree, and the curculio or stinging bug will fall on sheets spread below. These must be quickly picked up and destroyed. Begin the jarring just as soon as the petals drop and keep it up for about ten days. The plum knot must be cut off as soon as it appears, and you had better burn it. Cherries give us little trouble, except that they must be covered with mosquito netting to exclude the birds. Netting will last for three years if carefully preserved, and you should leave some of your trees for your allies in the air.

On the whole, the fight for our fruit is not so severe as one would judge, where no effort has been made to meet the difficulties. In 1909, however, there was a loss of three-fourths of the whole apple crop in New York and New England from the louse and lack of thinning. The country really cannot afford this shiftless way of dealing with the great

problem of production. The people need full crops, not only for home consumption, but to supply the population that is congested in cities.

For your own use an apple cellar is one of the most important rooms in the house. A dugout underneath your home, damp and nasty, with decaying vegetables and mould, is a breeder of pestilence, and you need not wonder that you have malaria and fevers. All cellars should be as clean as parlors, and the apple cellar should be a room by itself, sweet to the smell and free from every possible taint. I should prefer to have it an adjunct of the barn, provided it is entirely dissociated from the stables. Let it be at least seven feet to the ceiling, better eight, with very solid walls and plenty of windows. Ventilate it thoroughly all summer, and after your fruit has been placed in it for winter shut it up tightly and keep the thermometer as nearly as possible at thirty-three.

My cellar is furnished with bins where the apples can lie about eight inches thick. Apples as they are removed from the trees are handled like eggs; then instead of being poured from baskets they are laid out gently. From the wagon they are carefully sorted into firsts, seconds, and thirds. The firsts are carefully laid into bins, or if sold, into barrels; the seconds have their own bins and are as good as those generally found in market as firsts. As for the thirds, we can do nothing better with them than to turn them into cider.

This handling of apples applies to every other fruit — do it with refinement. The trouble with the pears and the peaches that rot in transit is very largely that they are tumbled about and rolled. They are poured from the picking bag or basket into the transit basket. Pickers are not careful and dealers are even less so. Nothing deserves your most careful handling more than these delicious gifts of Nature. Do not pull the fruit from the tree, but clip the stem. Do not lay them in piles on the ground, but ripen them in cool, dark places. Pears should be picked, as a rule, five or ten days before becoming soft and stored in dark rooms, or shipped at once.

Winter pears can be kept precisely like winter apples in bins. The Grand Duke plum also can be kept in cellars until midwinter. The storage of grapes depends upon so many conditions that I should not advise any effort at cellar storage. Keep them in dry rooms, spread thinly in baskets and covered with brown paper.

In Florida my orchard is something very different, but very delightful. Of course the orange stands first and is a close rival for the apples. In blossom, beginning in February, its fragrance rolls in waves with the wind for half a mile. Mingled with the odor of the pines, nothing can be more wholesome. Imagine three hundred full-grown orange trees, standing about twenty feet high, absolutely white with bloom, stormed by millions of bees, yet many sorts

still studded with golden fruit. The last year's crop will not be entirely gone before the first of June.

We speak of oranges here as we do of apples in the North; not in the general but in the particular, asking for a Ruby or a Jaffa or a Tardif or a Washington Naval. Most of these are of recent introduction and are improvements on the old sorts that were planted by the Spaniards. The lemon is slightly more tender to frost than the orange, yet you find here and there a tree covered with lighter yellow fruit bending its limbs to the ground. The grapefruit also is frequently planted in the same orchard, and this also bears its fruit very heavily.

But nothing is finished in the Florida orchard as nothing is through with evolution in the Northern orchard. In my short life is included the entire development of the whole Fameuse and Winesap families, which now include many of the best apples that we grow. The orange is on the same road of evolution, and while Mr. Burbank is working among the plums, and Stark Brothers are offering us such apples as King David, and Mr. Munson is originating such grapes as Headlight and Brilliant, new sorts of oranges, sweeter and richer, are being created in Florida. We have already a lemon that weighs two pounds, thin-skinned and exceedingly high flavored. It is a wonderful sight when filling full the limbs of a twelve-foot tree.

There is another fruit down there called the loquat. It is a combination of pear and cherry, a

pear in form and a cherry in flavor. It is so superb that Nature does not care to ship it — just makes it too delicate for anything but home use. The leaf looks much like a coarse elm, but it is evergreen. The huge clusters of flowers begin to open in November, and the first are barren, but they continue to expand through December and January. These end in great clusters of golden yellow fruit that the jays like to jab holes into to suck the juice and let in the sunshine.

A friend sent me a crate of pineapples. I supposed that I knew pineapples, but here was a novelty. Cut dead ripe from the stem, I was told to cut the apples into slices of half an inch thick, to pare these of the rind, and eat from hand. To sugar such a pineapple would be to sugar a Bartlett pear or a Northern Spy. I followed directions, and discovered what Byron could not find, "a new sensation." Here it works just the other way from what it does with peaches, for a single slice sends a joy all through you and two slices completely satisfy every knowable desire, leaving you the conviction that you could not add to your internal peacefulness. That is a vile thing that is shipped North, to be sugar soaked and iced. It is not the real pineapple.

We have mulberries in our Northern orchards, but we mostly leave them to the birds, as we should. I think that a row of mulberry trees at the rear of a country home would make a good wind-break and help considerably to keep the birds out of the gar-

den. But in Florida the mulberry is a marvel. As soon as it begins to ripen in March the mocking-birds and the cardinal birds and the blue jays and all other birds assemble in convention among the limbs, while hens compete with razorbacks for all that fall, and yet there is more than enough for human folks. I never saw any other tree that could so turn itself into a complete mass of fruit as the mulberry, each one about as big as your thumb. It is delicious to be eaten out of hand, but for puddings and pies, with a few drops of lemon juice added, it is the only conceivable rival of our Northern blackberry.

The Japanese persimmon has the family trait of astringency until dead ripe; then it is like a big red or yellow tomato, with a thick skin, while the contents are delicious clotted cream, to be eaten with a spoon. Some of these persimmons make bushes like quinces, but others stand tall and very like pear trees. The time of ripening runs from September until January. Our native persimmon, in its very best sorts, is not only more hardy than the Japanese, but is good enough to please the palate, yet at its best it can hardly bear comparison with the borrowed sorts. The persimmon, however, is destined to bear a very prominent place among American fruits during the coming century.

Fruit is doing a great deal to make our modern life sweeter and stronger. Every sort that I have named, both in the North and in the South, is on

the road of betterment, and we are moving forward and upward with our food. Slowly but surely we are becoming vegetarians; not vegetablearians, but eaters of nuts, fruits, and cereals as well as vegetables, in preference to meat. It is a hopeful sign when a nation works through its government, as ours is working, along this line of creative improvement. Anyone can become a creator, and while he immortalizes his name, can bless the whole human family with a new kind of food.

The apple is the one indispensable fruit; the orange is not. The average consumption of oranges has probably reached its maximum, and with oranges at a cent a piece and apples at five cents a piece, it needs no demonstration to convince us that the apple is not getting sufficient attention. Our whole nation needs to be waked up to this great fact that every educated apple orchardist can reap an abundant recompense for his work, while he becomes a national benefactor. It is not the work for a lout, but for a thinker and student. The tree and the fruit alike demand a good master.

CHAPTER IX

FINDING AND MAKING SOIL

ABOVE everything else Nature tries to make soil, and this, you may be sure, is what you will have to help her do, if you make a prosperous country home. Soil is by no means a "fixed quantity," as one of our recent text books tells us; on the contrary, soil elements are constantly being turned into soil, and soil turned back into its elements — out of reach of us. In summer Nature weaves an immense quantity of foliage, out of the air mostly, and then in the autumn throws tons of leaves down upon the earth to make, first, humus and then soil.

Fools burn leaves, leaving for themselves a pinch of poor ash, but sending back into the air what was taken from it by the process of growth. These thousands of tons are not made out of the earth but out of the air and are intended to be turned over into soil. If you plant a tree in a tub of dirt and leave it there until it weighs one hundred pounds, you will find, by weighing the dirt, that the tree was not made up of what was in the tub, but almost altogether of what it could get from the air — carbon

and nitrogen for the most part, with hydrogen composing a good share of the liquid part or sap.

The elements of the soil that are not in the air are deep down under the surface of the soil, or incorporated in the rocks. The most important are potash and phosphorus. You get some potash from ashes, weed waste, soap suds, and there are few soils that in their natural state are entirely deficient in this element. The timber soils of our corn belt contain about two thousand pounds of phosphorus per acre. Raising crops that use up these elements steadily lessens the possibility of growing any crops at all. We have got to find them in the soil; if we use them up, we have got to replace them.

Agriculture should be renamed aëriculture, because we are really taking from the air the larger part of our annual crops. What we must know is how to do this most readily. Our fathers knew that they must use manure and they knew that they must rotate crops. They knew also that living plants fed on decaying plants, this having first served as food for animals.

They did not know, however, and it was only recently discovered, that there was one class of plants that could take plant food directly from the air, using it at once for plant growth and then transferring it to the soil. It was not many years ago that we first found out that all leguminous plants, like clover, alfalfa, beans, peas, and in the South crimson clover, cow peas, velvet beans, and beggar weed had been

doing this very work and that, if given possession of the soil, they would not exhaust it of nitrogen, but would increase the nitrogen — that is the most important plant food.

Here we have the most wonderful of all facts concerning your little garden, or your larger fields, that by planting peas and beans, or sowing clover and alfalfa you are not exhausting your land — except in the way of phosphorus and potash. Then it was found that this specific power of legumes was due to nodules on the roots and that these nodules were the home of bacteria of a peculiar sort. Heretofore bacteria had not carried to the mind of the crop grower any pleasant suggestion. They were supposed as a rule to be associated with disease, but now bacteria began to be thought of as a beneficent agency.

Bacteria subdivide to multiply, and the Kansas Experiment Station reports that it estimates over one billion six hundred millions in a single gram of soil. As you go down into the earth bacterial life decreases, until it ceases entirely below six feet. As four-fifths of the air is nitrogen, the bacteria have a big field to work in. They transform it and then turn it over to the plant as food. Why? We do not know why, any more than we know how. But we do know that it is done in connection with the little appendages called tubercles or nodules on the roots of the legumes. If you will carefully dig a young clover (not pull it), and plunge the roots into warm water,

softly washing away the dirt, you will find them strung all along with beautiful and almost translucent round bodies: these are the home of the bacteria.

It was found a little later that if these bacteria nodules were lacking, the legumes would fail. Some soil, however, was found always supplied. Then it occurred to someone to inoculate the soil; that is, carry bacteria-supplied soil to localities lacking them, to see if it would work a change. It was discovered that every sort of legume had its own special bacteria and it would grow only when supplied with its own friends, but as a rule we could transplant the bacteria needed.

So we got alfalfa where it had refused to grow by giving it alfalfa bacteria. Some of these life germs are not very much unlike, however, for that which accompanies sweet clover will do for alfalfa. Beans and peas will grow for a while without any bacteria, but in that case they will exhaust the soil, while with bacteria they enrich it.

One experiment station reports that of two plats of soil, one inoculated and the other not, the first yielded over nine thousand pounds of green forage per acre, the other nine hundred; in hay, the first yielded twenty-five hundred pounds, and the other two hundred and thirty. So goes the most wonderful chapter on soil making and soil renewing. Rotation of crops is, of course, not superseded by this discovery, for it is still true that corn lands, after a few years, must be turned over to peas and clover,

the object being to restore the nitrogen. But now we are working with more precision; we know what is going on and we know that rotation will be of little use unless our beans and peas or vetch have bacterial aid.

Meanwhile the other side of the question was exploited; that is, if you grow nitrogen-procuring or leguminous plants altogether, while adding to the nitrogen, they will exhaust the potash and phosphorus. This gave the problem over to commercial fertilizers, which succeeded in furnishing the material that was lacking in the form of nitrates and muriates. Much of this served, however, only as a whip to a tired horse; nothing was added to the soil, but it was goaded to give out whatever life it contained. It is now found that there is a very marked limit to the value of even honest fertilizers. Their work rarely reaches beyond the season of their application.

Commercial fertilizers are certainly important, if understood and used under limitations, or I should say with additions. They supply some foods, but practically no organic matter, and the tendency is down and out. They are for good soil, and not for poor soil. I think if I were growing a bed of fancy strawberries I would use a liberal supply of muriate of potash and acid phosphate, but I should consider cottonseed meal more important as a real food; and then I would by no means omit a thorough preparation of the soil with compost and a mulch.

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Finely ground phosphate rock and limestone are what we require to help the legumes. In most of our soils we have almost unlimited supplies of mineral elements. These must be liberated; that is, set at work by adding decayed organic matter. The use of lime to aid in setting free the power of decaying stuff is of exceeding importance.

The barnyard gives us our best fertilizing material when supplementing legumes, and deep plowing to reach our mineral supplies comes next in importance. Every stable should be provided with a concrete trough to carry every ounce of urine to a concrete tank. It is the best fertilizer, in the best form, for plant food. The Chinese gardener uses no other.

Someone has spoken recently of "The Farm That Is Under Yours," meaning that we have much of our soil wealth forever untouched. We have to get down deep enough (with drainage as well as plowing); work up what is below; aerate it, and not leave it a dead weight on top of the soil. So then you may say that you have a farm in sight, another farm below in the earth, and a third farm above in the air; and you cannot make a good garden or orchard or grain field unless you can bring these three farms together and make them coöperate.

Now you understand why I have given soil-making a place in this brief discussion of farming. What is the use of purposing to double our milk supply, or our fruit supply, or our wheat crop, when really the land is not able to keep up the present

unsatisfactory yield? We must bring the soil elements together and increase the amount of good plant food. Meanwhile only a small fraction of what we call soil is plant food. For the present a very large amount in bulk is what we have recently learned to call humus. That is a new word with most country home-makers, but it means something vastly important. Humus is incipient soil; it is stuff on the road to be good plant food by and by.

It was thought for a while that it had no other office than to equalize moisture about the roots and to equalize temperature in the soil. That would be enough, if it were all. There is nothing more important than to keep moisture from rushing up out of the land into the air, and, next to that, we must keep the roots of our plants from feeling every change of weather. Humus is the stockings and the shoes that we put on our plants. But it is more, it is always yielding life.

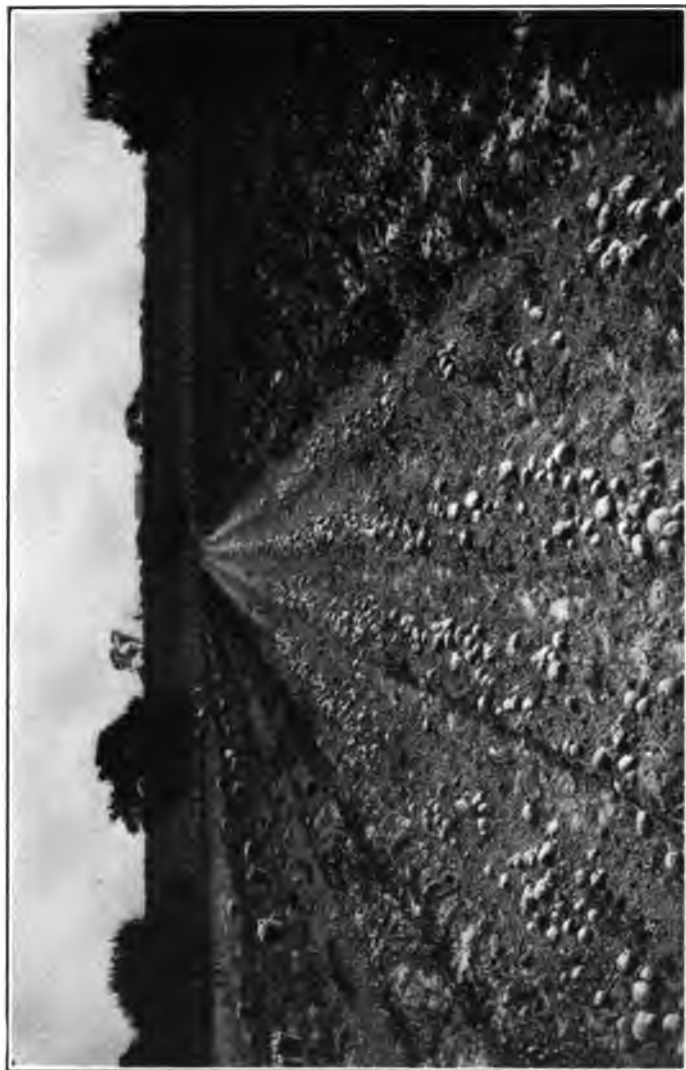
Anyone who has learned the importance of humus will understand me when I say I never burn an ounce of organic matter that can be decomposed with any kind of readiness. You can burn up soil in manure piles as easily as in leaf piles. Nearly all manure is charred by too rapid ferment, and the loss is estimated at eighty-five per cent of all that is made in the United States. Most of the stuff that is plowed in as manure, or used as top dressing, is already more than half burned.

The most wasteful method of using weeds, or

bean or pea vines, is to burn them. The result is only a few pounds of ashes and the loss of a large amount of ammonia or nitrogen. Everything that is intended as a fertilizer should be plowed under before it is dried up — (that is burned up). Otherwise we have lost our humus also.

Now is the time to tell you more of what compost is, how to make it and what to do with it. My first object is to accept Nature's offer of annual vegetation and to put it in such a place as will be best fitted gradually to transform it into soil. I wish as soon as possible to make it available as food for my plants and trees. Then I wish to add to this whatever other material I can find which will serve the same purpose. When you have once begun this system of soil making, you will be astounded to find how much good stuff goes to waste for lack of being collected and composted. Weeds, road dirt, muck, leaf mold, the contents of road ditches, ashes, old plaster, almost everything will be found to be of value. The barnyard manure, of course, will be added but in such a way as to check its decomposition. House waste and slops are exceedingly valuable in the same pile.

A compost heap may be made anywhere about your land, whether under cover or not. Put in layers the barnyard manure, autumn leaves, wasting weeds, old straw, and, if the material is very coarse, occasionally add lime. Let your piles alone until fall, then thoroughly comminute them, apply them, and plow



THE POTATO HARVEST

them under. If the material is very coarse it may be necessary to leave it in the pile for more than a year.

Try this compost plant at your country home and see how curiously the material that you can use will turn up and increase. Stuff that was in the way before now looks good to you. You clean up your lawns and your gardens and burn nothing but the bigger limbs. The ash of these gives you a little potash, but your compost pile gives you potash and phosphorus and nitrogen all together.

The most fertile spots on some farms that I know are in the corners of rail fences, where nothing but weeds grow. Haul this to your compost pile. The barnyard manure, mixed even carelessly, will not waste its nitrogen as it will when thrown raw on the field. If you have only half an acre, have also a compost pile; I have five of them for my nine acres. I grow squashes on them during the summer, so that they shall not look unsightly. Into one of them I run my cesspool material from the house. All this is wealth, and not an ounce should be wasted.

One ton of leaves contains sixteen pounds of nitrogen, six pounds of phosphoric acid, and six pounds of potash, and the same amount of weeds is worth a good deal more. A ton of old straw is worth nearly as much, and well composted with barn manure, and turned into humus, its value is greatly increased. One of the Southern experiment stations reports that the land normally produces one-fourth

of a bale of cotton to the acre, but by the annual application of thirty bushels of such compost as we have described, the yield has been increased to one and a half bales per acre, and ten bushels of corn have been increased fivefold.

The use of lime is important in connection with everything that has begun to be transformed and needs quickening; the coarser the material the more need of lime. Muck just dug from a pond or elsewhere must be aerated for at least a year, and lime helps greatly in transforming the mass. If already slacked, lime can be spread on the soil in any convenient way, or dumped in heaps and spread with a shovel. Where only small quantities of the unslacked are to be used, you can immerse it for a moment in water before applying it.

In what are called acid soils and those that contain a great deal of humus there is little danger from applying too much lime, but if applied in excessive amounts it will injure plants directly and damage the texture of the soil for growing future plants. This damage will not last a long while, because the carbonic acid of the soil will neutralize it. However, in your garden and orchard experiments you do not wish to make mistakes.

The experiment stations tell us that nearly all our garden vegetables are benefited by liming, especially lettuce, celery, onions, egg plant, asparagus, cabbage, peas; when we go into the field lime is decidedly useful for alfalfa and all the clovers, for barley and

wheat and oats, and for the common grasses. It is likely to injure melons and is not reported as of any use for corn and potatoes.

Two things we have got at so far, and they are both wonderful. First, we find that legumes, unlike all other plants, will get food directly for themselves out of the air and that this food when used by them, can be stored in the earth to be used by other plants. In this way we may use our soil forever. The old notion that worn out soils are a necessary consequence of use is all wrong. Soils are worn out to be sure, but it is from a bad use of them. We have found as a second most important fact that if we compost our waste stuff we can make out of what is generally thrown away the very best plant food conceivable.

Most of our weeds are our best farmers. They are busy working their roots down deep into the soil to bring up unclaimed elements, at the same time making the soil porous. Most of them have other uses, and I doubt if a single plant is in existence that illustrates "pure cussedness." Some of our very best vegetables were weeds when I was a boy.

The story of beggar weed is a good illustration. It got its bad name when it was supposed to be a weed and nothing more — the veriest plague of the cotton fields. A little while ago this same beggar weed was found to be the best forage and hay plant in the Southern States. Horses, cows, pigs, hens, everything devours it with greediness. The leaves are even being ground up to make flour, out of which

bread of a high quality is made. The velvet bean was a vine used only for ornament, but it has turned out to be a producer of the largest quantity of valuable hay and fodder known in the world.

Many of our weeds are valuable also as soil binders, while others, if handled rightly, lose all their troublesome qualities and can be added to our compost piles. There are a few weeds, mainly those that run under ground, or those that go to seed with great rapidity, which get in the way so badly as to deserve their evil reputation. Among these the Canada thistle, the wild morning glory, and quack grass are supreme for meanness.

In the Southern States they have what they call maiden cane grass, which is only our couch grass magnified and intensified. It will take possession of land with astounding rapidity, and its power to fight for the ground occupied is surprising. There is this thing about it, however, that even our couch grasses make good hay if cut early, and you can fertilize them to death. A good plan is to fence in these ungovernable pests to hogs — then move your hog pen around until you have cleaned out a good sized patch.

Salt kills some things, but that is no reason why it should be kept out of our gardens. It kills some of the worst weeds, but it stimulates grass and feeds asparagus. One of the very worst pests for a lawn is moneywort, but fed well with salt it passes away and at the same time grass takes its place. Use all

your waste brine and anything else that contains salt on your asparagus, or around your quinces and pears. Thorough cultivation will take care of most of the annual weeds and one or two hoeings will do the rest of it. In the fall I leave my last crop of purslane and chickweed to bind the soil through the winter. This is advisable only where your soil slopes so as to wash badly during the thaws and floods and is not advisable anywhere near strawberry beds, for chickweed, if it ever gets in, will never give up until the strawberries are plowed out.

Water in the soil is just as important as the soil itself. Every plant consists largely of water; potatoes are three-fourths water, and beets and carrots are nearly ninety per cent liquid. For every pound of dry matter in your wheat field you must have nearly four hundred pounds of water, and three hundred for every pound of solid matter in your clover field. Trees contain, as a rule, about one-third their weight of water, although this varies somewhat with the season and with the variety of tree. Professor Bailey estimates that fifty bushels of corn per acre, in order to mature will require one million and a half pounds of water; and two hundred bushels of potatoes will require in growth one and a quarter million pounds of water.

Now the point for the country home-maker is to find out just about how much water his soil needs; the superfluous must surely be drawn away, but enough must be retained. A thorough system of

drainage can never be omitted, and this is a very simple matter after all. Use up the stone that lies about much of your land, and where this cannot be had, tiling is a good substitute. Use four inch tile at least, for small tile is liable to cost more in the end than it saves.

We have already found that adding humus to the soil equalizes the moisture; that is, it holds the water that belongs there and will not let it be evaporated too rapidly. They have a way in very dry parts of the country of getting along without rain, by constant tillage. Instead of adopting or trying to adopt a system of irrigation, the plow is run all the season. The surface soil is kept loose and porous, so that it will absorb moisture rather than let it free. This is the only cure for drought, where a system of irrigation is impossible. It is a good plan anyway, for it keeps the weeds down, as well as holds the moisture in.

In other articles I have spoken of mulching, and this is exactly what we are doing in keeping the surface soil stirred, we are keeping a sort of blanket all over the earth. The same effect, or better, is accomplished by the mulch that you place around your trees; it holds the moisture in, with the roots and positively prevents drying out. Work the mulch principle for all it is worth, and I assure you you will have good trees and good plants.

But mulching, as we are using the word here, is something more; it is covering a whole field with lit-

ter or straw or forkable compost and leaving this stuff on, without stirring, all through the season's growth. Generally the crop is cultivated once or twice before the mulch is put on, or in some cases the field is covered as soon as planted. I have tried this plan with potatoes, covering with coarse hay or grass, and the plants came up through the mulch with readiness, while the yield was as good as it would have been with constant cultivation.

In this case irrigation is accomplished at the same time that the work of cultivation is dispensed with. The economy of the matter depends, of course, on the result in the way of crops. The reports from our experiment stations show that if mulch is applied very early in the spring it prevents the ground from being thoroughly warmed up, and this will check vegetable growth. It was found unwise to mulch onions and corn, but favorable results came from mulching potatoes, beans, tomatoes, and vines.

Direct irrigation has become a matter of immense importance in the arid sections of the country, but skilled gardeners know very well that it is just as valuable in the Eastern States, where droughts are irregular, but quite possible. Outside of the arid section, the simplest method is to have a windmill, lifting water from a deep well or pond or flowing stream to a tank, from which the water is distributed through troughs or pipe.

Just as important as water, however, is air in the soil. The roots of plants are only underground

limbs, and they breathe just as the limbs breathe. They obtain oxygen from the air and throw off carbon gases. The soil must be so prepared and so kept during the growing season that the roots can have a sufficient supply of this gas or air. This means that the soil on which we walk is not by any means all of it made of soil particles, but that much of it is air. In clay soils the air spaces are small and the roots are less likely to be well supplied with what they need for healthy action.

The object of plowing is to stir the soil and let the air in, and almost invariably root health depends upon frequent stirring of the soil with the cultivator. Drainage works in the same way, for as it lets the water out, it lets the air in. A shower of rain does good, not only by furnishing moisture, but by putting the air in motion. At the same time a shower is very liable to form a crust on the surface that prevents the free passage of air. This must be broken up with the cultivator.

In sandy soil there may be too much air, and in this case the micro-organisms that are at work on the humus are as badly disturbed as from a lack of aëration. At the same time fungoid formations are developed that burn out the soil. So you find that there is plenty of use for brains at every stage of our work, even in the smallest of gardens.

Just at this point note the relation of the work which is being carried on by and for the plants and human health. While the roots are taking up car-

bon dioxides, they are alienating them from oxygen and ozone, which are let loose into the air. In the process of breathing all animals, including man, throw off poisonous gases which the plants immediately take up and weave into foliage and fruit. We need every particle of the ozone that in turn is given off for us.

House plants, if healthy, are during the winter a sort of family doctor, using up a good share of the poison that is breathed into the atmosphere by the occupants of the house and weaving it over into something beautiful. Each little pot of geraniums gives us a quota of ozone in return for what it selects.

A good deal more important is it that the streets of the village be well lined with trees and that these trees be of a sort that can take up the pools and puddles and street drainage, working it over into shade-giving foliage and fruit. Those are ignorant mischief-makers who either cut or mutilate street trees. Be sure also that around your house there is enough foliage, not for shade only but for purifying the air. Vines growing all over the house do no harm whatever, but they do a vast amount of direct benefit in the way of giving you wholesome air while using up the poisonous.

The difference between sandy and clay soils is mainly that with the first we must establish a first rate root system, and after that we must supply a larger amount of mulch. Turn under your legumes, as well as rye or any other succulent stuff. Learn to

make use of the worst of weeds, for they are sometimes the best of manure.

Soil, however, varies so greatly, often every few rods, that we cannot lay down general rules for all particular cases. There remains work for the brain, and now we have not only the aid of agricultural colleges, but the railroads are establishing chains of test farms across our States to study the peculiarities of the soil and aid the farmers.

Subsoils are frequently worth a good deal more than surface soils, and they must be constantly brought up for use. If you cannot get at it any more easily, send down the alfalfa, whose tap root often goes twenty feet below the best plow. The passage of the long roots through the soil loosens it, and when they die there is humus away down below where anything before was available. Under the sand often lies clay, or mixed soils, that are richer than the surface.

However small your property, you had better be in communication with your State experiment station and invite them to examine your soils. It will be of no use to send a little bottle of it to them, for you have probably a dozen sorts on a ten acre field. Especially if you are going to try a home in some other part of the country, find out ahead something about what you are to cultivate.

Soil waste I have said but little about, but I cannot close this chapter until it is discussed more care-

fully. When I first made a serious business of gardening, I found that the winter wash and the spring floods took off a large part of all that I could add during the summer. It was carried down to my neighbors' gardens, or it went into the road ditches and then into the flat lands near the mill and then was carted by the wide awake miller to fatten his potatoes.

I found that shallow surface ditches, made by the plow in November, with some additional work of the shovel, could be made to take this wash and carry it quickly and safely out of my fields. These shallow sluice-ways would disappear in the spring under the work of the cultivator. This will require a little careful study on your part, but be sure not to omit it.

So you see that what you want is first of all to make soil, then you must know how to keep it, and then how to use it. You must not burn weeds nor leaves. You must use your coal ashes, specially if your soil is heavy. You must not have a slop hole near your house, but must compost the house waste as well as all other waste and feed it to your plants. Take off your hat to the brains that are at work everywhere about you. Do not get in the way and hinder and do not fail to understand.

Country home making in America is in its infancy. Our gardening is still almost as crude as that of the aborigines. We waste shamefully, and we overlook our best property. However, we are beginning to

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be able to see the way to *make* soil, to *enrich* soil, and to use it for all that it is worth *without exhausting* it. We shall soon have land in the United States that will feed six hundred millions of people, without serious crowding and without pinching poverty.

CHAPTER X

MANUAL TRAINING IN THE COUNTRY HOME

WE are holding always to the idea that, in the country, home does not mean the house only, but the whole property, and homeful it should all be together. This chapter will talk of such accessories as are essential to completeness of life, and to enjoyment as well as labor — shops, barns, laboratories, arboreal retreats, electric plants for lighting and irrigating, and whatever else seems essential to making a home in the country comfortable and convenient. There really is no reason for drawing an unfavorable comparison between city life and country life as they may be at present enjoyed, for we now have in the country nearly every privilege that fifty years ago belonged to the town. To all this we are able to add a good list of special privileges that cannot be acquired by the city resident.

In the order of importance I would place first of all a shop, and the purchase of shop tools should be as prompt as those for use in the soil. It should serve as a schoolhouse and a shop in one, for manual culture is really educative for the brain as well as the

hands. A shop is peculiarly a developing affair, beginning with little more than the storage of a few tools and a place for filing saws and grinding scythes, but rapidly becoming a place for constructing all sorts of boy ideas into workable forms.

My own shop was built as a wing to the barn; it was two stories in height — the lower to be the shop, while the room above was to be the laboratory. Each room was twenty-five feet square, and the ground floor was grouted. Into the shop the boys were turned loose to make their own tools and every way to develop an inventive skill. For this reason very few tools were purchased at the outset, only the material for making tools. After awhile a gasoline engine and lathe were purchased, larger and better than they themselves could construct.

Good chisels, screw drivers, grafting sets, and similar appurtenances for indoor and outdoor work were rapidly added, invariably homemade. Of course repairing was in order from the outset. Shovels and hoes and plows were easily put in order by the lads, while from the house chairs, tables, knives, etc., called for their attention. All this saved within a year's time more than the original outlay.

Hand power soon proved inadequate to the needs of the young workmen, and an effort was put forth to use wind power — brought down from a boy-invented fan over the roof. It worked of course only when the wind blew, and so irregularly that it was of very little value to the youngsters below. When

given up, as it soon was, the shafting was still left to pass through the floors, and the fans continued to tell which way the wind blew. This was a convenience to a large neighborhood. Standing very high over the valley it still can be seen for a half a mile, and as it turns with a slightly mournful sound, it is known as the "Old Cow."

The first important effort on the part of the young folk was to build a two-horse power engine, on a principle somewhat different from the engine that had been purchased. It did its work fairly well, but it called for many a consultation both in its construction and in its working. It still remains to turn the grindstone, saw the wood, grind bones for the fowls, cut fodder for the cows, and in the autumn it still crushes the waste apples for cider.

Some years later I discovered that two of my sons were quietly studying up a scheme that called for a considerable outlay of money and time. One of them did most of the planning; the other most of the work, as usual. This was about the beginning of the automobile evolution, and it was soon evident that an automobile was incubating in my shop. It was not a case where the mountain labored and brought forth a mouse, but the mouse labored and brought forth a mountain. It certainly would go, but like all the early automobiles, it was liable to run up a tree rather than travel the highway.

No matter, the shop was serving its purpose as an educator, and it was an important accessory to a true

country home life. Going by the door one day, as the engine snorted gas through the exhaust pipe, I said to my boy, "With your other inventions, try for something to prevent this confounded noise." The result was a muffler which he is now constructing on a large scale, and which seems likely to make his occupation for some years to come. I am not sure but all this while, the literary culture of my children was slightly suffering; and yet I led them, with tutors, through a very thorough course of history and language — giving them mathematics as they needed it. Only this was apparent, that they valued knowledge mainly for what they could *do* with it. A storage of information did not seem to be attractive.

For a college bred man, rather strongly addicted to literary pursuits, I had made quite a divergence from conventional methods of training young people. It soon became evident that through the shop I was likely to lose not only from literary pursuits, but from horticultural, at least two of my boys. However, I looked out for it that they should carry off with them a thorough training in agriculture and such a love of Nature that they could not become alien to the country.

Meanwhile the young folk are kept at home by the variety that is offered to the mind and the hand. Frequently the girl in the family will prove to be the keenest mathematician and the best mechanic. Intimacy with tools will bring out power, sharpen intellect, smoothen passion, and sweeten the disposition

that books will sour. Try it with the chap who hates school, and do not forget that the shop itself is a school. To develop the hand is as important as to develop the brain. To learn to do is better than simply to remember. To get the habit of applying knowledge as quickly as acquired to everyday affairs, and in this way using all that you find out, is the one great need in human life, and it is the real education.

I believe in public free schools, for in no other way can most children get any education worth while, but I am sure that the home and the school have been too radically divorced.

The laboratory is closely associated with the shop, and, as I have told you, I established such a department directly over the shop. It soon became the center of life, of discussion, of examination, and comparative investigation. Those who did not care for tools found that which was both interesting and useful in the laboratory. Country life is made up largely of flowers, insects, birds, rocks, and the evolution which is told by the life in animal and vegetable nature.

The country home that knows nothing of these things and brings up its children to know a bird simply as a bird, whether thrush or sparrow; to look upon all insects as merely bugs or bees or flies, is stupidly superficial. The very first information that a boy should have should concern itself with soils, rocks, watercourses, and generally with that which

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we call geology. It is the science of the stuff that makes up the farm. There is not a single science but has more or less bearing upon country homes and country living.

In the country home laboratory we are specifically studying home, and the things that make for home; the pebbles that a boy naturally plays with and the flowers that first of all draw a child's attention. In the chemistry corner we analyze the water and the soil and enter intimately into the questions of health. In the entomological corner we determine what butterflies and moths and bugs and beetles are our neighbors and how to use them, as well as keep the evil disposed from destroying our crops. In the botany corner, where there should be plenty of drawers and boxes, the study of plants and trees becomes exceedingly practical. They should be studied not simply as so much vegetation, but as something that makes up a part of our own home life. In the geological corner the rocks and rolling stones are to be considered, the water courses, and that wonderful roll of hills and valleys which so accentuates the charm of country living.

Merely to collect all the moths of a section, or the butterflies of a very small section, and mount them perfectly develops the esthetic sense and a taste for the beautiful. It teaches careful observation. In the long run accuracy always comes in ahead of smartness, so that this sort of study does not bring to the front either mere memory power or boldness.

My oldest boy, at seventeen, came to me for sixty dollars to put into a few country telephones. This was a perfectly natural outgrowth of his training. So we took in our neighbors, and during the next five years he strung us on lines of communication. The first rural telephone systems were being just then established, and he very naturally became identified with one of the most beneficent movements of the age.

The entomologist was like all the rest of them, only that his dealing with minuter stuff made him more persistent. It is astonishing to one who has been educated only with books to find how much interesting material there is in the garden and field to one who has been educated in shop and laboratory. We who have worshiped only books look with wonder on those who worship tools. A boy who puts under his pillow at night a new tool, instead of the latest novel, has a new sort of probability ahead of him.

You will surmise that drawing is a very needful adjunct to the studies that we have assigned to this room. Nothing like enough has been made of the pencil and the hand in education. They should always be busy to help note the peculiarities and the minute features of anything that comes under observation. The pencil is also a great educator in the way of teaching patience, accuracy, and fundamental truth. It is a serious blunder to form a habit of half way investigating, and therefore of falsely judging.

Now in all this matter of shop and laboratory we are working on the understanding that the boys and the girls must be brought into intimacy with Nature. Some one has said that if you study a single leaf all your life, you will not then know all about it. A Frenchman wrote a book, entitled "The Population of a Pear Tree," and he made out that his tree was the home of a host. What is going on over a five acre lot constitutes a huge library at first hand.

Then again, in the winter months, your shop and laboratory constitute just the places for more nature study. If you have an orchard, as of course you have, you can collect enough larvæ or cocoons under the bark to keep yourselves busy in the entomological corner. Chemistry is always in order, and if you run short of object lessons go to the shop and construct. I do not advocate throwing out mathematics and history, but you will find that these studies illuminate laboratory work and are illuminated by it.

The simplest way for arranging your laboratory for work will be to have corner closets. In one of these you have a sufficient supply of bottles and preservative liquids for the most ordinary chemical analysis. Entomology needs its cabinets, its catching nets, and its preparations for preparing what is caught for permanent preservation. Geological collections require glass cases or simple shelves, while a fourth corner will readily adjust itself with tables and drawers for botanical work. None of this work



Photograph by Porch.

CULTIVATE THE USE OF LABOR-SAVING MACHINERY

can be hurried, and the apparatus will grow naturally.

A tool room, and a very large one at that, should be adjacent to the shop. For the orchard we need a complete set of apparatus for spraying. For the garden we want a digging fork, a spade, and iron trowels. A sprinkling pail should always be on hand, and a scythe should hang in its corner, with whetstone in a box adjacent. The farm tools need not be costly, but it is poor economy to have a plow or cultivator or planter of second class. Economy at this point is never desirable. The shop is to see that good tools are always in repair.

So far as teachers are concerned, very little direct instruction is needed, further than to get a good text book in each department, and if possible secure a tutor who will stimulate work. There is nothing more exciting for young people than making collections in the field. A good leader is wanted rather than a teacher.

I recommend to those who cannot create anything elaborate in the way of shop or laboratory, to combine the two in one, at least for a while. Let this be the general proposition, that the young folks are to study first the things that are nearest at hand — those under foot and most observable; second, that they study the life that is in all things about them, from the worms in the soil to the birds in the trees; that they inquire into the relations of things, and what

the most insignificant are good for. I would let each one have a hobby of his own and should rather expect that he would.

Not very unlike this plan is that which has been recently suggested and urged, that one half of each school day be given to books and the other half used in a school garden and orchard, applying the facts obtained from books and securing new ones. At all events you are bringing along muscular power with brain power, and are at the same time making home something exceedingly attractive to your boys. Apart from the cash problem, which we shall consider another month, we are getting a very different sort of country home from that which follows the ordinary method of sharply dividing school and home.

With a laboratory and shop attachment for every country home, I think we should not hear again from Secretary Wilson that the city is draining the country of its best brains and blood. At any rate do not feed your boys and girls on that false and shallow literature which teaches that the country boy who can escape from the farm is rising in the world. He is at the top of the heap who does his duty and uses his faculties for the best purposes, making the most of the world about him and living temperately.

We have come across the effort to use wind power in our discussion of the shop. No country home can be anywhere near complete without the control of some power supplementary to man power and woman power. Even the old dog churn served a good pur-

pose, and the dog power still stands for a large factor in Belgian country life. Wind power is of course irregular, but in many cases it is the best thing that the farmer or country home maker can secure. With it he can generally keep a water tank filled (by means of a windmill), and the water from this tank can empty its contents through pipes into his kitchen and possibly any room of his house. This will save a lot of pumping.

Unfortunately steam power has been from the outset almost strictly a town privilege. It could not be carried for effective application more than a few rods. In this way steam power drew the industries into huge buildings and built up great factories, at the same time emptying our country homes of nearly all their most attractive employments.

Fortunately electricity is a distributive force and can be carried almost anywhere and to any distance. We can get Niagara to do its work in the center of New York State and can distribute its power among the farmers' homes. The French Republic sells electric power derived from its canals to the adjacent farmers, giving them force enough to run machinery both outdoors and in. Wherever there is a stream that tumbles down hill you have power, and that power can be carried over into the barns and houses. Many a farmer has a brook of this sort which is now giving only water for his cattle, or possibly a little poetry to his daily life. If it can be made to develop two or more horse power, it is an easy matter to install

a dynamo that will carry power for lighting his house and operating his machinery.

You can scarcely overestimate the advantage of some such power in removing every sentiment of drudgery from daily life. It will run the feed mills, the pumps, the threshing machines, the corn shellers; indoors, it will wash the dishes and do the cleaning as well as carpet and floor scrubbing. It fits nicely to the work done in the shop, beside doing some of the shop work.

I note that two neighbors in central New York have secured power enough from a brook, that for ages has only tumbled down a glen and run through a meadow, to light all their buildings, do a large share of the home work — and after harnessing it, they have sold power to their neighbors. From western New York comes a story that shows how half a dozen or more country home makers can coöperate to the same end. It goes a long way toward solving the terrible help problem, not only in the field but in the kitchen. The housewife can get more work out of a brook than out of a dozen Bridgets.

In my Florida home we are making our sixty-five-foot well coöperate with a gasoline engine and dynamo, not only to serve water for the household, but to give us electric lights, independent of any town or neighborhood plant. Mr. F. O. Kennedy, of Orange County, Vt., reports that his wife cooks, washes, and irons, besides running a vacuum cleaner, by electricity, while he separates milk and milks his cows

with electric power. His home farm comprises two hundred and sixty-three acres, but he adds that having electricity to run his machinery, he hires very little help except in haying and harvesting. Where there are electric companies, with electric plants, it is not infrequent that you can purchase power enough, at a reasonable rate, for lighting buildings and doing a large share of your work. This of course is an easy way of settling the help problem.

The original cost of a gasoline engine that will do your ordinary farm work will not exceed one hundred and fifty dollars, for a two- or three-horse power machine. Not seldom you can purchase one at a very much reduced rate. Even if it does no more than run your grindstone, your churn, your washing machine, besides waiting on the boys in the shop and cutting feed for the horses and cows, it will serve a satisfactory purpose. But in selecting an engine it will be better to get one large enough to work easily, especially as a larger engine is less likely to get out of repair.

If you have a flowing well, such as is very common in the celery fields of Florida, the problem is solved for you, but otherwise a storage tank becomes an essential. This tank must of course be filled either by hand power or electric power, or by a gasoline engine. If you have a gasoline engine, of course you have only to attach a hose and carry the water where you like. You can at least take good care of a strawberry bed a few yards square, and in such a case a

large part of the work could be done by forcing the water into tiles, these being set on a slight slope and so constructed as to let the water flow at stated points.

Among country home accessories the barn is about as old as the house, and for some reason or other it has remained just a barn — a building to hold hay and straw and without the least chance to please anything excepting horses and cows. If it is comfortable and decent it is held to be satisfactory. I do not think that the coming country home will be satisfied with anything of this sort. The barn may become the center of attraction, not only on account of such accessories as laboratory and shop, but owing to the beauty of its structure and its fitness to all the other buildings. A stable should be not only cleanly, but capable of perfect ventilation, while every cow and horse should have abundant light. There is no unconquerable reason why the windows should be covered with cobwebs and dust.

A horse enjoys an occasional bath just as much as a human being, if given with discretion and in the warm sunshine. I have not gone so far as to give the same privilege to my Jersey and Holstein grade, but I see no reason why they would not welcome it. Can you tell me why every American stable should not be kept as clean as those in the dairy sections of England, swept as cleanly as a house, and brushed to prevent the accumulation of dust? The carriage and wagon floors should certainly never be allowed to ac-

cumulate a load of clay or filth. This seems like an impossibility to the average home keeper, who is generally short of help. Let your barn floor be made extra tight, and then carry to it the hose from your gasoline engine or water tank, and you may clean it without serious labor on your own part and without much delay.

A dirty barn is like a dirty house, simply a matter of habit. Keep a good broom at hand, and "brush out" as the housewife brushes the kitchen and porch, as soon as she is abroad in the morning. The barn lawns can be kept just as tidy as those about the house and with very little outlay of time and work. The gain will far outbalance the cost, and especially in the way of creating a tidy and comfortable sentiment about the homestead. I have no fancy notions about this matter, but I am sure that every one will be surprised at the great improvement he can make at little cost.

I have before spoken of the enormous crops one can gather from the walls of house, barns, and other outbuildings. You can never get too many good grapes, as they are valuable for all sorts of purposes. Nor do I see why they should not be so abundant as to be very free for your help as well as for your family. If you will run wires parallel to each other, all the way around your barn, or any other outbuilding, you may attach vines until the whole becomes an arbor. I find that in this way I am able to grow most superb Lindleys and Gaertners and Brightons with

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Niagaras; even Jeffersons, that do not ripen well in vineyards, will come to perfection.

During the summer you will only be compelled to go over these vines, reaching them with a ladder, two or three times from May till August — tying the runners and occasionally thinning the clusters. You will be sure to get your very best clusters, most perfectly colored and ripened, on your buildings. The vineyard will not be able to compete. If the vines are planted in the barnyard, you must box them until they get out of reach of the animals, that is, till the vines are ten or twelve feet high. Let the boxes be such as will admit more or less light, but will not admit the inquisitive tongue of your pet Ayrshire. A decently arranged home will teach the young folk to handle food of this sort conservatively, but let them prefer grapes to tobacco.

Let us get this matter comprehensively in mind; a group comprising a shop, a laboratory, a Jersey apartment, a horse room, a hen room, all with pleasant windows, and a tool room close by the shop — this is a real barn. The whole of this is to be surrounded by preference with apple trees; or with plums and shrubs, while vines cover the whole, bearing grapes — I should like to say tons of grapes, for really it will be something of that sort if your vines are properly cared for. I have not sketched the buildings required for a large farm, but those belonging naturally to the small country home, such

as we hope to multiply very rapidly, to relieve congested city life.

Among the smaller appurtenances of the country home are a hot bed, a seed bed, a nursery, and arbors. A hot bed is a box of almost any form, set over a fermenting bed of horse manure, while this is overlaid with very fine soil. Here you enjoy yourself sowing your choicest seeds and those that must be started before frost is entirely out of the land. Here also you place those seeds that are so fine that they cannot be trusted in the open ground during dashing showers. Every country home can easily have a little hot bed of this sort, if nothing more than a drygoods box sunk in the soil, and covered with an old window sash. Much better is it to build a little brick or concrete lean-to against the barn.

A seed bed differs from a hot bed in this, that it is a little nook of ground, or a corner of the garden, so arranged that you can cover it if necessary. It must contain very finely prepared soil, where you can test new seeds. It is not the mere starting of choice seeds that we are after, but to form a habit of saving the finest seeds of the finest fruits that we eat and giving them a chance to grow and show what is in them. Did you ever think what wonderful possibilities are thrown away in the seeds that are wasted?

You have learned that no two of the seeds of an apple or pear will produce trees and fruits that are identical, or are like the fruit from which they came,

so you see you are always on the track of new things. As it will take several years for apple seeds to develop into bearing trees, you can meanwhile be at work with rose seeds or with plum stones, or with the seeds of any bush or shrub, and my word for it you will develop some fine things. Label everything that you plant, with stakes in which you have inserted bits of zinc on which you write with a pencil.

Everywhere novelties and improved varieties are finding their way in spite of the number that are destroyed. In Florida we have recently obtained a nearly seedless grapefruit and an orange with honeyed sweetness. In the North we are guided by the fact that Nature manages to produce something choice in fence corners and out of the way places. This was the way we got the Seckel pear and the Concord grape.

Right alongside your seed beds, have an equally well prepared plot for starting cuttings. Almost all our fruits and shrubs can be propagated in this manner, but more particularly grapes, figs, mulberries, and quinces. Make the cuttings from one foot to two feet in length and insert them two-thirds in the soil, pressing it very tight about them. In a few years you will have all the trees and vines that you need to plant or sell or give away.

Still one more plot, and it should be a tidy little place, where you create a nursery. This differs from the plots already described, because here you grow young trees or bushes that you have collected and put

them through a period of testing. You can collect no end of these in your shrubbery, and when you are accustomed to looking for them, you will find them everywhere — asking you to give them room and a chance. These three plots of ground should constitute a pet retreat for both work and study — especially in your old age. They will ultimately be a source of considerable income, as well as of immense pleasure.

I do not think much of arbors, that is of wooden affairs, conventionally set up to adorn the grounds, but rarely used. Nature does much better with a lot of thorn trees and grape vines — that is living arbors. You can yourself make a living arbor by planting a circle of evergreens, rather closely together, with a diameter of about twenty feet. As the evergreens grow, the interior limbs, interlocking, will die out at the bottom, and must be removed. Overhead they will lock together, and you will have a most complete and shaded retreat.

I can show you a living arbor with the roof fifty feet above the floor and carpeted with several inches of spruce needles. Squirrels like it, and a catbird calls it home. Here you may swing a hammock if you please, and the bird looking down through the glinting shadows, will sing you any song that you will whistle back to him.

I am aware that I have not outlined for you a country home that will suit the victims of conventionalism, nor have I tried to do it. I have aimed

to show how a much more complete home life may be lived than is ordinarily lived; how the idea of a simple home life may take in thinking and loving and doing altogether; how religion and art and science may pull together in our daily lives; and how this sort of a home will fascinate the young people, keep them out of mischief, and make them love home better than any other spot in the world.

CHAPTER XI

FINE ARTS OF A COUNTRY HOME

THE old fashioned country home was rich in arts, both indoors and out. The Connecticut boy was trained not only to farm the land, but to some additional employment for rainy days, for he well understood that he must lose no time if he would fare well in a busy world. If it rained he sat down to a shoe bench and with no mean skill made or mended shoes for his family and neighbors. He could shoe a horse if it came to a pinch, and there were few articles of furniture in his house that were not made by his hands. Others made brooms, or even clocks; only they made hay while the sun shone. I well remember one whose pastures were filled with sheep and when he killed one for family use the skin was tanned in a home vat, with bark ground by a home brook, under a crusher worked out of a conglomerate that he had himself quarried from his own glen.

His wife washed and carded the wool, spun the fleecy roll, wove the yarn into cloth or carpets, and sewed what she had created into homeful garments. It was little that such a family had to buy. I am

sorry for anyone who cannot remember candle dipping or wool dyeing or soap making. Each of these household arts had its own day, generally twice a year. Candles, to save time, were always dipped in the evening after the milk was cared for and the daily tasks were ended. A dozen long wicks were attached to a rod and these were dipped into the melted tallow and lifted out long enough to cool. Once, twice, three times, I do not remember rightly, but I think that it took twenty or thirty dips before candles were of the right size, and then they were left over night to get cold and solid.

Lye was first made by leaching home-made ashes and the soap was made in the back yard, boiled in a huge iron kettle. It was not so interesting and as I remember this soap of a Sunday morning at the weekly round-up of all the children, it got into our eyes and we spluttered and spat — always in vain. Sometimes, to save time, we recited our Sunday-school verses at the same time. Those were days of economy. We prayed while we plowed and said over our spiritual lessons while we milked; we had no time for one thing alone.

Ashes that were not needed for lye were sold to make pearlash or saleratus; lime, while not quite a home product, was made coöperatively. Whatever things we could not ourselves make we swapped for; honey for lime, and eggs for sugar. When a calf was killed one quarter was reserved for home use, but three were sent to neighbors who had agreed

to replace them when their turn should come to kill a fatted calf.

Making sugar was also a domestic affair. Nearly everyone had his own maple bush or grove. Fifty trees, at four pounds each, would make sugar enough for a large family. The whole affair was a romance from the tapping of the trees to the final "sugaring-off." In these days no one knows of these things, but I advise you to buy a gallon of maple syrup and have a "sugaring-off" before you die. That and samp will make life seem a deal longer and worth the while. Get some old farmer to show you the way it was done.

"Samp!" Why that was our ambrosia, fit for the gods who dwell in the country and plant gardens. It was made of the selectest ears of corn, dried by the stove, shelled by the owner, ground by itself, so as not to be mixed in the miller's hopper with all sorts of corn, and then with the finer meal sifted out it was boiled all day in an iron pot on the back of the stove. It was stirred by everyone who passed near the stove and after twelve hours cooking it was *samp*. Alas, the art is lost. Wendell Phillips wrote about the lost arts of Egypt, but we also have lost arts in America.

Bee-keeping supplemented sugar making, but we have that yet, bless the Lord! No one has been able to make honey like the bees, although there have been some attempts I believe.

We had no creameries in those days, but each

family made its own butter and its own cheese and the rivalry was worth the while I assure you. Girls were not ashamed to call the cows and then to draw the milk from the udder with freshly washed hands. They were proud of the great white loaves of bread that they could pile on the shelves and the rolls of golden butter that mated them. We never then heard of foul milk that must be sterilized before using; that did not come in until the hayfield and the barn and the kitchen were given over to "help"—unclean, uncouth, and untrained—a generation that knew not the art of the milkmaid.

Such was the life of our fathers and mothers, not at all the hard unpoetic life that has often been pictured, for a sweeter and more wholesome life than that which was lived by those who pioneered out of New England across the continent, planting States and creating everywhere country homes, never existed. Then came steam power and, we did not understand why, but one after another of these home arts went away from us; carding, spinning, shoemaking, furniture making, and at last even sewing and knitting; all of these went out of home life into huge factories, around which clustered the dull sleeping and eating places that were called homes. The spinning wheel went to the attic and the soap barrel to kindling wood. Our mothers no longer knitted as they walked through the streets to make a friendly call. They no longer swapped pinks and hollyhocks and boiled down syrup over the kitchen fire.



Photograph by Paul Thompson.

A BROOK COMBINES BEAUTY AND USEFULNESS

It left a lonesome home, where there was little that was interesting to be done and all things were toil. The wife no longer wove and the daughter no longer milked, although the very word wife was originally weaver and the origin of the word daughter, away back in early Aryan life, was milker. Everything lost track of itself and words lost their meaning. Swapping made way for that sort of commerce which needs money, and the simple hearted home keepers knew not what to do with this paper stuff. Having a bunch of it when the hops or the plums brought a good price, they bought pianos to stand where the spinning wheel had stood. On these after a while the auctioneer played and the heartsick owner went into the city to find work.

Steam not only took away country industries, but so exalted town employments as to concentrate wealth and multiply by contrast town privileges. The city was drawing the best blood and the brightest brains away from the country. Its churches got the chief talent and then the country churches died all over the hillsides and in the villages they just kept alive — to little purpose. Music of the highest order was heard only in the larger towns and the help of skilled physicians could be reached only at great cost.

One weekly newspaper reached the country family and a letter now and then that cost the receiver eighteen and three quarter cents for postage. Even when this was lowered to a reasonable cost, he must drive or walk five or ten miles to his postoffice. His

city cousin read his morning paper over his coffee and felt that he alone was "in the world." This would not have been so bad if the country dweller, beside isolation, had not felt that he was "out of the world."

In this way steam had incidentally the effect of so depressing country life that the farmer became Old Hayseed. Farms were sold at half cost and hundreds of fairly good New England homesteads were deserted entirely. Some of the New England States published annually a list of deserted homes — given up because there was no sale for them and the owners were tired of the hard life lived on them. They had gone West to more fertile soil, yet in Kansas in 1890 they fed wheat to their hogs and corn brought so low a price that it was burned for fuel. Nearly seventy per cent of the increase of population was rushing into city life and there congestion grew sickening.

These old arts of the country home went to stay — most of them. It will not pay us now to try to restore them. The spinning wheel cannot be recalled so long as a single machine, driven by steam, can do the work of ten thousand of them. When some English folk thought to do this, they could not find a single wheel in all Lancashire. We keep them now only as interesting relics of arts that are lost. We can buy soap much cheaper than we can make it, and candles remain only in ecclesiastical lingerie.

I am not sure that it is worth the while to put

sewing lessons into our schools, for needle art will not regain its domestic value. So with knitting and with penmanship. Machinery is everywhere. The typewriter has driven out the quill and even spelling is no longer of as much value as the skill of the stenographer on the keys. If my boy spells phonetically instead of lexicographically I am not sure but he is right. We must keep our eyes in our foreheads and look out for new ways of doing things as well as new tools to do with.

The newer day is surely coming in, a day full of new domestic arts. It will not recall the old, not to any fulness; but the coming country life will be very full of fine arts, that will reawaken content with country living, while interest in domestic affairs will be as great as in former days, or more so. No, we are not going to adopt city arts nor city ways, we have no need in the country for three changes of dress in a day and as for automobiles, well, I suppose that soon they will be built cheaper than horses can be bred.

It was between 1880 and 1890 that country troubles culminated. About 1890 the trolley began to run its fingers in among the hills, to find our isolated homes, and link them to each other and to the town. About the same time an inspired Postmaster General inaugurated rural free mail delivery. It looked to be paternalistic, and some called it a socialistic movement, but soon the carrier came, to carry cosmopoli-

tan privileges to those whose homes had been hid in the most remote corners and in the back woods. The day had dawned for evening up.

Isolation was completely banished and when the rural telephone strung our homes on wires that talk and a little home under the elms expanded to take in the whole land at once, we knew that a new sort of age had begun. Now I may call up Boston before breakfast; or, in the afternoon, I may visit my friend in Chicago, without travel or cost — almost. This is the first chapter and it means that we are privileged to partake with the city and to share in everything that constitutes modern civic life. The trolley carries us to the market town every half hour and once a day the carrier brings the news from Mongolia, Calcutta, New York, London, and Washington. We know what Congress is doing as soon as our city cousins. The telephone has brought us quite close to legislation and the farmer has a potent say at every capital.

But this is by no means all, for the country home has much that the city has not and never can have. It not only has its brooks and its groves and its fresh brewed air, but it has a lot of new industries that wonderfully well fill the place of those we lost half a hundred years ago. The McCormick reaper began a change in the way of tools and the exploitation of energy. It lifted up the man with the sickle and cradle and bade him ride. The age of horse power tools was followed by electric power tools,

but I have said enough of this under the discussion of shops.

Exactly what is to come out of the telephone, trolley, and mail delivery is not by any means yet evident. The telephone is already connecting us with the market, so as to free us from the wiles of speculators. My customers can call on me any day for fruit. If I wish for a teamster I am sure that O'Brien has a telephone in his house.

As for the trolley, it is now hauling long lines of Ohio wagons, geared to the track and loaded with produce, into the market cities. The carrier will soon go by automobile through his district, not only with letters and papers, but with parcels. Nor can my distaste for this dust-raising vehicle shut my eyes to the fact that it belongs essentially to the country. The railroad car must follow tracks from town to town, but the automobile with its gasoline power or electricity goes where it pleases — regardless of the city.

In some ways the new country home will be no more interesting than the old time house, but it will always have a bathroom, more surely than it will have a library, and it will have wider verandas, with a distinct understanding that the first aim of the household is to secure health. We shall live out of doors and we shall know how to gather about us more liberally what Nature and Art offer to make life sweet and wholesome.

The new country life will expect the home maker

to be a student of the landscape, not merely to hire a landscape gardener. Nothing can be more doleful than living in a house that was planned by somebody else, unless it be walking around grounds that you had no hand or thought in laying out; no wish anywhere; not a longing put in shape — somebody else's longings and whims for your occupation. Trying will soon make you skilful and witty in the making of gardens and lawns, if you put your hands and brains together. And after a while you will get in love with this sort of country living and doing.

Forestry also comes within the circuit of the home maker's work. Wind-breaks will be made more of as the wilderness is swept away. Let Nature have a free hand along your lines and plant defenses against the storm. We may prefer her mixture of evergreens and wild cherries, or we may choose to plant a wall of crab-apples fronted with bush honeysuckles. Everywhere there is country art, for Nature herself is preëminently an artist.

You will fail of making a country home if you fail to appreciate the art that is contained in all the life about you. A robin's nest is simplicity and rusticity itself, but whoever saw a nest full of those blue eggs, so perfect in color and in form, without a shout of joy and a thrill of gladness? In their city studios they have no color masters like a bed of roses. Jenny Lind could not quite equal the catbird and the meadow lark. The bees in their hives under the lindens build to beat the best architects.

We are going to lay more emphasis hereafter on the simply beautiful; we shall have a keener dislike for piles of old brush and unused litter, as well as for that indescribable confusion of purpose which has so generally characterized farm life. However, be careful not to overdo this tendency and allow anywhere about your house and grounds a suggestion of mere brains and wealth. It is the hand that we need to glorify and the country home must never fail to honor hand-craft.

It was a great day for the country when the Agricultural College Land Grant passed through Congress. The Civil War was raging at a horrible cost to the land, but this bill was nearly compensatory. No one knew it then, but they can know it now. Every State is being organized industrially, so that education no longer means the ability to parse a Latin verb, but the ability to understand and parse well the songs of the bees and the trills of the brooks and the harmonies that make up garden and orchard.

It is a wonderful thing when our colleges step in front of our troubles and tell us how to duplicate our crops, at the same time mastering their enemies. It is a new day indeed and a new purport for education, for it makes of us entomologists, or in the broader sense biologists. The use of proper spraying materials compelled orchard owners to become practical chemists. The bungling work that sprays the wrong stuff on guess work will accomplish nothing, but in all cases the brain is awakened to direct the

muscles. Bulletins from Washington and from the State stations have become the text books of the people.

Grandeur yet is the art of creating. This is the one achievement that is bringing us most nearly into sonship with the Infinite Mind — the crossing of old varieties or species and making new ones at will. Sex runs through all Nature. In some plants both principles are united, but in others, as frequently in strawberries and grapes and sometimes in apples and pears, they are separated. Pollen must be carried from one tree or vine to another to secure a perfect development of fruit, and this process always breaks up continuity of form and quality.

Here lies the secret of Nature, whereby new sorts are constantly being developed. The grains of pollen, carried from one plant to another, result in seed that involves the qualities of both parents. This sort of work can be done by art much more carefully than Nature undertakes to do it. The pollen is carefully removed from that which shall be the mother flower, and in its stead is dusted pollen from that which is intended for the other parent. When this is undertaken with the skill of Mr. Burbank, it puts cross-breeding into the class of fine arts. He has something in mind which he wishes to create, and although he does not secure exactly that which he desires he is sure to approximate it.

As a rule, home builders may let Nature do the crossing while they tend only to the selecting. Na-

ture will find means sufficient to do her share of the work. She keeps the bees and insects as well as the wind at work; and then the birds and animals, having eaten the fruit, scatter the seed. Man comes in to destroy the poorest and make sure of the preservation of the best. In the wild state that is best as a rule which has the toughest wood, but in the cultivated state, that is best which gives the largest and sweetest fruit.

So you see that if you leave to Nature to finish up this job, she will multiply all the time the most prolific and hardiest. No one can guess how many millions of magnificent products have been crowded down and out by coarser stock. When by careful art we have secured a cross of high value the problem comes how to preserve it. There are three ways; by root division, by grafting, and by planting seed. It happens, however, that there is not a single apple swinging on a bough in the United States that is not more or less already cross-fertilized. It has in it the spirit or life of many parents. If we sow its seed we will not get the same apple. We must rely upon grafting a selected sort into inferior stock.

By grafting near the ground we can sometimes induce roots to start above the insertion of the scion, after which we have the new variety on its own roots. In this way I have a half dozen of the very choicest plums that can be multiplied by young shoots that come up from the ground instead of by grafting. When working at this magnificent art, be careful not

to send out for propagation anything inferior. Even Mr. Burbank has given us worthless rubbish as well as superb achievements.

In my chapter on House Building I did not discuss concrete, and for this reason, that it belongs here among our new home arts, to illustrate the additions which have been recently made to the interests of country homes. I myself wish that we could reinstate the simplicity of log house days, with large fireplaces and a general homefulness we do not find in the modern house. We can do something even better than this where our soil is sandy and something even more beautiful. In Florida I found that I owned about two hundred acres of good building sand. Mix four of sand to one of cement, and you can turn half of the whole State into concrete blocks. More to the point is it that you and your family can make the blocks at odd times, and store them for use.

Two thousand blocks, sixteen by eight by eight, will build a fine bungalow of four rooms and a kitchen. Not counting your own labor and your family's labor, your house will not cost you beyond five hundred dollars. The floors and roof of Southern pine may also be of your own cutting. My boys use a machine that cost less than forty dollars and with it turn out between sixty and eighty blocks a day. All of these are hollowed by a simple device that lessens their weight and adds strength while lowering cost. The work is attractive to young people and

they should be allowed considerable freedom in the way of inventing new styles and new methods. This will develop esthetic taste and call out individual powers of action.

A concrete farmhouse insures coolness in summer and warmth in winter, it needs no repairs, no wall paper or mortar, is fire-proof, and can be kept sanitary with the least possible attention. There is no better material for barn and stable floors, or for troughs and tanks. These can be kept easily disinfected, while they never wear out. Concrete cisterns and well curbs set well into the ground keep out surface water, decreasing the danger of infection. A concrete barn can be made to retain its sweetness and cleanliness, while thoroughly ventilated. Concrete steps and sidewalks make an attractive approach to your buildings and are far less perishable than brick or common stone. I have no doubt that this new art of house building, with home material by home hands, is to be the rule over a large part of the country.

Now install a gasoline engine, with a dynamo, and you may lift water to a tank for irrigation, while at the same time you light your house with generated electricity. You may make it a two story and eight room house at about double the cost. You will of course include one or more fireplaces, and your whole chimney as well as the walls of the house may be made of concrete. Rat-proof foundations and mouse-proof division walls are included. Here is a great

revolution, or evolution rather, coming in the way of country home making.

I ought surely in this chapter to recall the wonderful art of inoculating soil, so that it will be capable of growing certain plants that otherwise it could not. There are thousands of acres of alfalfa furnishing three crops a year, on soil that before inoculation would not yield even one crop. What are these bacteria? It is hard to tell even yet; only they are of infinite sorts, everywhere, in the land and air and water. We have under laboratory examination at least a thousand kinds, most of which can be put to use, but some of which are most destructive enemies. The new farmer has got to know a good deal about these minute organisms that our fathers never even heard of, or he will not be able to keep up with his age.

Every country home should be in this way a sort of experiment station, not only for the interest there is in it but for the contribution made to the public. In horticulture just now we need a lot of new things, and someone must either discover or create them. We need an absolutely hardy red raspberry, equal otherwise to the Cuthbert; also a thoroughly thornless blackberry, equal otherwise to King Philip or Eldorado. Among the strawberries it will do no harm for experimenters to see if they can improve a little on William Belt. We need nearly seedless apples, and pears, and oranges, and especially grapes.

Everywhere in orchard and garden, as well as in

stables, we need improvement, and each man can very easily find a field of work for himself. He will run across problems everywhere, if he thinks while he works. If you get gloomy or lonesome, go out and converse with your seedlings — your vegetable children — and you will refresh your spirit wonderfully.

I remember the whole history of garden berries in American gardens, from the introduction of Wilson's Albany strawberry and the Red Antwerp raspberry. In my childhood there were in our gardens none of these things, only quinces and gooseberries; while around the fences black raspberries were occasionally sowed by the birds, and in our pastures and meadows were wild strawberries — five hundred to the quart. William Wood, in 1629, said, "There be strawberries in abundance in New England, and one may gather sixteen quarts in half a day." This was about the state of affairs until 1850, and then we began to have berry gardens that were worth the while. The race of huge berries began, however, at least twenty years later — the one-to-a-mouthful or twenty-to-a-quart sort.

We have to learn how to sympathize with trees and shrubs, enter into their will and purpose, exactly as we do with animals. It will never do to think that all trees can be even trimmed alike, much less fed alike, any more than a stable full of horses, cows, and sheep. The country home maker has to study all these things, not in the general, but in the particular. Pruning and trimming and helping a tree must be

gin when it is first transferred to our soil and must continue as long as the tree lives.

I think sixty years in these days is considered a satisfactory period for an orchard, yet I see no reason why with proper care an orchard may not live around two hundred years, bearing fruit all the time. Trees are forced in the nurseries, fed with commercial fertilizers or rank manure, not sufficiently pruned at setting, devitalized with suckers, then allowed to overbear when young and when altogether out of good condition a professional trimmer is let loose among them at two dollars a day. Poor orchard! Why should it not die an early death?

The fine arts that will be evolved in the garden, orchard, meadow, and shop of the future country home can only be guessed by those who are somewhat acquainted with what is now being worked out by our agricultural colleges — the most wonderful institutions of this age. Of the half hundred now in existence, not one but is closing in on problems the solution of which will render our homes not only richer in crops, but in sciences and arts.

Quite as notable as those out of doors will be the arts of indoor life. Refinement will mark the coming home, not style and show but the spirit of order and enlightenment which comes from the right sort of culture. When we have made over the kitchen, with electric power in the place of stupid help, the housewife can take her position without lowering her womanhood. The true kitchen is really a lab-

oratory, and cooking is as high an art in chemistry as the experimentations of a college laboratory. Really the woman's corner of a daily newspaper records more inventions than can be found anywhere else in daily life. The combinations which bring forth nourishment from weeds as well as vegetables and fruits, are becoming numberless. Shall we ever have a cook book that will include simply the science of the matter and that teaches us how to eat in order to live and be strong?

There is a simple index of country life to be seen in the way the table is set. A careless mind discovers itself in confusion, in the placing of food upon the table without order, but the table of another woman reveals the esthetic sense cultivated — just trifles to be sure, but they spell out a good deal, just as the alphabet does. These little things cost not much in the way of labor, but they go into character. The refined use of flowers throughout the house will do much to make life cheerful and coöperation more easy.

The tin can deserves a whole article to itself. Seventy-five years ago it had not been invented. In those days we had wonderful jars of pickles and pots of preserves, but the art of keeping the whole pear and the uncooked berries through the entire year, or even many years, no one had yet dreamed. It would give me real pleasure to place here, in capital letters, the name of the first woman who ever put up a can of strawberries or cherries. It was one

of those rare inspirations that change the whole domestic and social life of the world.

To-day the can is as common in South Africa as in New Jersey. It lies in piles everywhere, defying the plow or the shovel to cover it. It lies beside the cabin of the Southern negro, emptied of corn, asparagus, green peas, peaches, and a dozen other luxuries. That marvelous novelty the "love apple" of our mothers, now the tomato, sells by the millions of cans in China and Japan. All the world has gone a canning. Every little home is finding its pride and its pleasure in turning winter into summer. A wealthy friend, dressed in her silks and jewels, recently led me through her store room with a pride equal to that shown in the ball room, as she waved her hand over the hundreds of cans and jars, saying, "I did this with my own hands." It is one of the finest arts yet invented.

However, we count most of all in this indoor living on the presence of electric power to light the house and the outhouses, to bring water into the kitchen and hot water into the chambers, operating the churn, washing dishes, scrubbing floors, sweeping and cleansing the house of dust, in a way that our mothers could not have foreseen. Only the other day came news that we could store heat as well as power, a new and novel discovery already applied in English kitchens, whereby electric-born heat is stored for use, while the electric power is switched



Photograph by Mary H. Northend.

WHAT CAN BE DONE ON A SMALL SCALE WITH POND LILIES



off for several hours of work at the churn or other service.

We shall not go backward to pick up the charming industries of elder days, but we are surely going forward to make indoor life more beautiful and less taskful. This it seems to me is what the country home is going to be, not a whit behind town life, but very far ahead of it in its arts and its sciences as well as its pleasures and its profits. It will have about all that heretofore has been associated closely with the crowded town, and will also have its rural charms, its freedom of simplicity and its association with Nature. Agriculture or land tillage in any form will not only be the equal, but supreme among the industries. It is left now for the Burbanks and the Munsons and the Budds and the Baileys to marshal mankind and lead the world.

CHAPTER XII

CAN WE MAKE IT PAY?

WE come to this problem at last, and if we cannot solve it in the affirmative this whole business of making country homes for everyone is out of the question. We have involved more or less of a reply in several of the preceding chapters; what we want now is to get at the dollars and cents. Land costs, experience costs, trees and plants cost; one must feed and clothe his family; coal bills and meat bills and taxes count in the country as well as in the city. In addition to our common needs, we must keep a horse and a cow and some other domestic animals as coöperators and their feed cannot be had for nothing. The problem of health is not to be dodged, and wages are double what they were forty years ago.

Facing these difficulties I should not be willing to invite into the country anyone who does not stand a fair chance of overcoming them. I am going to try to show you that the majority can do this and so we shall find out that making a country home is not only a matter of sentiment, but of economy.

A letter from Chicago says, "I am willing to work hard if I can just hear a brook all day and I would

like to do my sewing out under an apple tree. I want some fresh air; and then I want some fresh things out of my own garden for dinner." Her husband wrote on the back of the sheet, "What I want is to own a piece of land and nobody to lord it over me or tell me what to do with it. I am willing to stand by my own mistakes and do a lot of learning." Here is sentiment enough for anybody, but there is a practicality about it and I did not hesitate to answer, "You will do well almost anywhere among the trees and brooks. Evidently what you want is what Nature offers first, that is beauty, but you comprehend the fact that the beautiful and the useful are identical."

Only those who have answered three hundred letters of inquiry in a single year, most of them on account of these chapters as they appeared in magazine form, as I have, can understand the difficulty of making adequate replies to the thousand and one different temperaments, with different tastes, involving capital and health. I do not believe I can do a better thing, before discussing the matter in dollars and cents, than to give you half a dozen of these letters.

One of them writes, "I wish to grow apples. I have money enough to plant an orchard and run it for several years without profit. I know that these larger fruits will bring in very little inside eight or ten years. But I do not know what varieties to plant, nor am I quite sure what part of the coun-

try is most desirable in which to settle. About trimming and grafting and budding and mulching I know nothing, excepting what I got out of your book on the Orchard. Can you spend time to give me a few hints?"

To this young man I answered, "Go to Cornell University, or some other agricultural college for two years, where you can learn the latest information about varieties, how to plant trees as well as select them, and how to handle your fruit and market it. After you have secured this training you can buy property safely either in New England or in New York or in Missouri or in Michigan, while Colorado and the Pacific States are very tempting. This year all our apples are in Oregon, Washington, and California. This has to do partly with careless apple growing and it has to do with insects and fungus, and how to ward off the effects of a warm March.

"Scientific apple growing should yield one hundred dollars to each tree, every four years, but ignorant apple growing will leave you out of pocket. A good apple tree, well cared for, should yield four to eight barrels of apples per year. Now what you want to find out is the best yielders and those that bear annually." My readers can pick out of this letter and my response a whole lot of information that is not on the surface.

Another letter reads, "We are two women, teachers, tired out, and we want to get where we shall be

free from continual nerve strain and get close to the dirt. We are willing to do outdoor work and we don't suppose that country living consists merely in cultivating pinks and roses. A new sort of teaching is coming into our schools and we are not fit for it. We don't know anything about industrial training and we are willing to give way to those who do. We believe in this new sort of learning and think the boys and girls ought to have it. We want to learn how to grow things. We have about two thousand dollars apiece. That will take care of us until we have had some experience, will it not? Now tell us where you think we should go? Honest, we are not over fifty-five, either of us, in good health, homely, and not a bit afraid of using our hands."

To this letter I replied, "Very good. You have capital enough to buy twenty acres of land in Michigan, Florida, or California; to put up a seven hundred dollar house and a two hundred dollar barn, with hotbeds and other attachments. You can plant enough fruit trees to start with; then keep hens and if you are in the right place you can keep a couple of boarders. Build your house so that it can be enlarged for more occupants, if the future demands it. I should advise you, on the whole, to go to a warmer climate where you can work all winter."

Quite a bunch of letters is illustrated by this one; "I have worn myself out with shop work. I want outdoor life, and the doctor insists on my having

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it. I am thirty-eight years of age, had some experience in farm life when a boy. Can I start now at gardening and make a living? I have a wife and two children, but I have only eleven hundred dollars to begin on."

"In your case I should say it would be wise to clerk it awhile longer, if thereby you can raise your capital to twenty-five hundred or three thousand dollars. I do not know you personally, but I have strong disinclination to calling anyone into the country who has nothing to carry him over the experience period and the possible depressions from ill health. But if you cannot secure more capital, make your trial somewhat in this way. Buy a small property near a city and start in on truck gardening. This will give you something to sell the first year. Meanwhile you can plant fruit trees for the future and you can have a berry garden, which will yield you something the second year.

"It will be necessary to keep your own horse and do your own marketing. Find private customers as soon as possible and treat them with the utmost honor. Make your name highly respectable. A few hens will give you chickens and eggs and a cow will give you milk. Here you are. You will have to economize in your foods and you must not waste a dime on tobacco."

Another letter pleases me better than any that I have quoted and it comes from a woman. She writes, "My husband and I always pull together

and we are going to pull together in another direction. We have been reading your articles and we are going to have a country home — sure. We do not write to ask you where we shall go, that we have decided for ourselves. We are going to raise hens and chickens, partly because we like to and partly because we think there is a living in it. We have been reading ——'s book, but we do not believe one-half that he says. We surely shall not go away from the city expecting to get rich at once. We are healthy, fairly honest, and we have a lot of stick-to-it-iveness. What we want of you is to tell us whether you would combine with raising fowls raising small fruits. Don't you think that we could get a good deal of use out of our hens by letting them have the run of a small orchard? If this letter bothers you, burn it."

To this letter I answered, "You have hit it just right. Plant a plum yard and let it be a chicken yard at the same time. Give a part of your fowls the run of an apple orchard, at least part of the year. I have a neighbor whose fifty chickens have had the range of my gardens and orchards all summer. They have done me vastly more good than harm. The point is to keep down the bugs and the trypetta flies and all the rest of the vermin. There is nothing else in the world so good as hens to do this, not even the birds. I take it, however, you will cultivate birds also. The amount of income in such a case as yours is not the point, nor ought I to undertake to tell

you how much you will earn. Those extravagant stories that some authors indulge in are not the stuff to make good country homes. Simply do your level best on the track you have selected and you can surely make it pay."

The best thing about the last letter I have quoted is the coöperative spirit. In the country it is impossible to thrive without the woman can see things out of doors and do them as well as indoors. She ought to be able to have a swarm of bees, toss off a load of hay on a pinch, harness a horse, or milk a cow, without thinking it unwomanly. Foreigners who come to this country succeed as a rule in country home making, and it is almost invariably because they live simply, keep money in hand, and forego luxuries, while the whole family works together in the field and in the house.

A widow wrote me some time since that she was possessed of two girls, twelve and fifteen years of age, that she was living on a very small income, fortunately a fixed affair, but not large enough to enable her to educate these girls to a fashionable life. She was thinking of finding a country home, where their training would be largely in matters of natural science and where they could themselves earn their own living while they were learning. I advised this woman to find a suburban residence, possibly rent it at first and start in with a garden of flowers and strawberries. Then branch into the

caring for green house flowers. I would have a shrubbery and it should consist of lilacs and other shrubs that furnish a large quantity of saleable flowers. This is a blunder about many green houses, that they do not have shrubberies or tulips and lilies in large stock. Here again I could have quoted amazing results, only to mislead the letter writer and make mischief.

The fact is that conditions and temperaments vary so greatly that it is utterly impossible either in a letter or in a book to give anything more than a general outline of advice. This one thing holds good all the time, that you must go out prepared to rough it somewhat and be satisfied with a moderate income.

Three letters turn up here next, each one of them inquiring about the exploiting companies that are sending out circulars bidding for these new country home makers with inducements that are startling. What they have to say is sometimes true, but there is this one single reply to be made in all such cases; never buy a rod of land until you have seen it. Then, after you have become fairly well acquainted with the land and its surroundings, stay long enough to comprehend the climate, and then you must know your relations to market and your probable relations to neighbors. It will not be a severe judgment to say that much the larger part of this advertising is not true. I have seen some pitiful results from the

credulity of poor people who have let loose of their small capital for a piece of property adjacent to swamps, if not itself under water.

From the letters which I have quoted I want you to gather one thing. Every one must have some capital when going to the country, unless it be when settling in the suburbs of a town where strawberries and fowls will bring in a quick return. There is this other exception, where a young man is possessed of good health and muscle and without bad habits is willing to commit himself to an honest experiment. Running in debt is not advisable, unless you have carefully gone over the conditions so as to be sure that there will be a balance in your favor each year. And then you must keep a bank account as soon as possible. Nothing so stimulates industry as having a deposit showing that industry is profitable.

Have your outgo and your income down in figures. I like the idea of drawing up a budget. Every man should have a budget, that is, he should look ahead and determine as nearly as possible what his outgo and income are likely to be during the coming twelve months. Then he should compel his expenditures to tally with this forward looking. Always know which way you are facing — toward prosperity or bankruptcy.

Gardening as a rule is the easiest hold for ordinary city people. There are not so many secrets about growing beets, carrots, potatoes, and beans as there

are about growing plums and apples and cherries. Any good agricultural paper will carry you through your experiments and lead you safely to success. There is of course much more to gardening than appears on the surface, but you can learn most of this as you move on. You have to make your soil, as well as cultivate your plants, but this I have told you about in another chapter.

You must not count on large returns until you have planted considerable experience as well as seeds, but with the worst sort of blundering you can hardly fail to get enough vegetables for home consumption the first year and the waste can go to your cow and horse. I could easily repeat a lot of fine stories, showing what somebody has done with an onion bed, or with a field of beans or peas, only you would probably be misled by such stories.

What you can do will be something like this; from a garden five rods square, get your table corn in succession from July to September. You will from the same field get plenty of green peas during the same period. For string beans and shell beans you will need another strip about one rod by four or five. Potatoes will call for a third strip six rods by four, and good mellow soil it must be to give you good returns. Now when you come to planting for market, multiply the strips according to the amount of vegetables you are prepared to truck and sell. In the Southern States we try sweet potatoes and cassava and never expect to find the market overstocked.

If you prefer to begin with a berry garden and go into small fruit growing, you will need for home consumption, for a single family of five, about one hundred plants of strawberries and one hundred of raspberries. You have already learned that strawberries will bear the first year, but that the raspberries will need a year to grow their canes which never bear two years in succession. Now once more multiply your plot according to the size of the business you are to conduct. One acre of red raspberries, carefully tilled and marketed, ought to bring you about fifty bushels of fruit, and if sold directly to your customers, you will find the ruling prices to be at least fifteen cents a quart. It is a capital berry to handle, only one must be up and doing with it early in the morning, Sundays not excepted.

Nature has arranged this matter of small fruit ripening very nicely, so that we find one sort succeeding another in such a way that we can do a great deal of the handling by home pickers. About the first of July we begin currant picking, confidently expecting to net at least one hundred dollars from each acre. Black raspberries accompany the currants and red raspberries follow immediately after, and are themselves succeeded by the blackberries. This is just the succession you desire, and from two acres you are probably picking to the value of three hundred dollars — with an increase each year. These gardens will improve for five or ten years and will

be profitable even longer. Later, after your apples are well grown, you will get from the same ground another crop and it should average twenty dollars to every apple tree that is in perfect condition.

Right after the berries follow the cherries and then the plums, with more or less early pears and apples, and after that both the apples and the pears that go into winter storage. If you learn how to handle apples as they should be handled and secure private customers, you will net these years at least four dollars per barrel. I am to-day selling my extra select Spys for six dollars per barrel. In the South we start with oranges, but we do not expect much profit during the first five years. We look to our Japanese persimmons and mulberries and loquats and plums for fruit about the third year from planting. The Southerner, however, is almost sure to combine truck growing and orcharding, except only where celery or some other hobby has secured the field. These specialties win big prices for awhile but soon glut the market.

You see I am not counting on any large amount of income during the first year or two, only we must have a full family supply at once. The surplus from strawberry beds or vegetable beds must be canned for winter use. There is no better winter food than what you can grow yourself if you will learn how to put it up. A little later you may depend upon it that a small canning establishment will make

a profitable department of every home, just as also a small cider press will turn waste into profit for the orchard.

Lima beans constitute one of the most delicious and nourishing of all foods; save your dried ones, as well as all the bush beans you do not use or sell during the summer. In the course of five years you can have a storage of plums, pears, berries, and vegetables. You are not getting rich, are you? Well, you are at least on the road to comfort, and a good income is in sight.

A good deal, all this while, is offered out of hand by Nature. The troublesome dandelion is a blessing in disguise, it is not only of big food value, but if you wish your hens to lay eggs, throw bushels of dandelions into their yard. Wild scoke makes another superb "greens" and the hated purslane is a third. Wild grapes make better jelly than the vineyard grapes, and that from wild gooseberries can hardly be surpassed.

All this time keep your compost piles building, and once or twice a year distribute and plow them under. You are not a good country home maker unless your soil grows richer constantly, and this is just what Americans must learn, that every acre may double its produce until the whole land is a garden. Do not throw away the suckers from your raspberries, but constantly enlarge your gardens by planting them. You can have the beautiful everywhere as well as the useful, and this you secure while you

arrange your planting so as to keep up a succession of fruit ripening through the whole year. You could not handle a crop of five hundred bushels of strawberries without a good deal of hired help, but one hundred bushels of currants, succeeded by one hundred bushels of berries, and these by plums and other fruits, while they keep you busy, do not involve you in very heavy expenses.

I have, however, a good deal of sympathy with those who prefer to start their country experience with poultry raising. The price of eggs is not likely to fall below thirty cents in the winter and twenty in the summer. The market is always sure, and it does not vary greatly in different parts of the country. Only you must have a cheap home food, or the hens will not only take your table waste and steal your small fruits, but they will run up a mill bill, destroying everything and yet not satisfied, nor laying enough to make it pay. At any rate let this matter be well thought out and a good proportion established between cost of keeping and income from eggs and broilers.

Be sure also to have good poultry fences between yourself and your neighbors. A little management will give a good wide range for your hens, where they will keep lawns and vegetable gardens cleared of crickets and grasshoppers, curculios and other noxious bugs, while excluded from the gooseberries and the strawberries. It is a much easier problem in the South, where biddy can range the fields twelve

months of the year. You have only to add cassava and sweet potatoes, which you can grow in unlimited supplies. Always pet your biddies; talk with them as if they understood you, allow no one to scare them, and they will soon be much more manageable. Kill the crazy ones that fly and yell if you go near them. The tame ones are the best layers and you will be taking your basket of eggs to market twice a week from twenty hens and bringing home instead what groceries you need. I should like to make some figures here concerning broilers and eggs, but all of these estimates are dangerous. I simply think that with common sense and study of conditions, raising fowls is a capital way of beginning home life in the country.

Now consider the bees, with honey from sixteen to twenty cents a pound, and twelve to fifteen hives, on a place of ten or fifteen acres. From these hives with ordinary care, provided you have basswoods and wild cherries blossoming near by as well as a few acres of berries and fruit trees, you will take up from six hundred to a thousand pounds of honey annually. You may figure out the income according to the market that you have, but my estimate would be, after deducting one hundred pounds for home use, one hundred and twenty-five dollars clear income for the balance.

This does not count in the incalculable benefit derived from the bees in pollenizing your fruit. Place no credit in the rumors that they damage your fruit

by puncturing; they eat only where orioles or hornets have done the mischief. Bees and chickens fall easily to the women's side of the work. In Florida I have a neighbor who has over one hundred hens and they are all named. Her forty turkeys obey her orders like trained soldiers. Her bees, however, are over my side of the fence. With fowls and bees and mushrooms and flower gardens and a vegetable garden, a woman can make a fair living, all alone. As a rule she finds less trouble with help than a man.

You will observe that I am dodging around this question of help constantly. It has become a terrible problem in the country, provided we are not able to furnish a good deal of home work and do a good deal ourselves. Still I know some of the best vegetable gardeners who plant for succession, as I have suggested in the orchard, and get on with very little outside assistance. In Texas the women are running dairies, while others are goose farmers, and in the fruit sections not a few have canneries and make money at it. I know at least one who bakes for a half dozen neighbors and, with the addition of a small cannery to use up wasting fruit, furnishes her own food and something of a surplus.

Just here let us consider. You can, if you prefer, with the garden and table waste feed one pig, or a calf, or a dozen hens, but not all of them. A cow will require house slops once a day and that will take about all the daily table waste. She will need

steady attention, regular milking, and her individual whims must be understood. Or you can feed a pig or a calf much of this stuff, only you can never allow them to be stunted, for after that all the feed in the world will not make one of them worth a tuppence. A college professor had two Jersey cows and a single pig, and that pig, getting all the surplus milk, soon became a notable hog. The highly pleased professor next year kept six pigs, but in the fall these were still pigs and utterly worthless. What you want is to turn your waste into food and make money out of what some people throw away.

We must not only use up waste, but we must learn to reduce outgo to a minimum. I know country families that buy coal for the whole year round and this adds to their expense from fifty to one hundred dollars. I have been able from my ten acres to supply my kitchen stove with fuel for six months in the year, during the last thirty years. It is curious how much fuel is constantly being provided in the trimmings necessary to keep first class gardens and orchards in healthy order. You can raise your own meat, or its equivalent, as I have shown and your own vegetables.

Do not begin your country experience by exploiting and displaying. Do not plant a big orange grove in the South, or go too heavily into strawberries or apples in the North. Feel your way. The waste apples in your orchard should be turned to vinegar and cider and here comes in another hun-



THE COUNTRY HOME-MAKER MUST NOT BE AFRAID OF HARD WORK

dred dollars from ten acres. As one travels about the country he will be surprised at the amount of money invested in tools that are left to the friction of storms and the wear of the weather. From insects alone we are losing one-fifth of the products of the United States, while poor storage reduces our properties another fifth.

Every country school house should teach economics. There is nothing in country life that cannot be overcome by application of thought and labor and it is this overcoming that makes life worth the while. A recent bulletin from an agricultural college reports, from accurate tests, that over one-third the cows that are kept for dairy purposes do not pay for their feed and care. Recent discussion of high prices has also brought out the fact that the bulk of country homes do not produce their own food. "Not a few farmers buy every vegetable that they eat, potatoes excepted, and all their fruit as well as most of their meat." They have a few hens straggling about, doing more mischief than they do good. Yet it is just as possible as ever to save in these lines. Potatoes, beans, and peas are as nutritious as meat and should be supplied abundantly by every garden. The French farmer not only raises his own vegetables and nearly all his food, but makes his own fertilizers. We waste our soil-making stuff and buy fertilizers not half as good.

A country home with an orchard of ungrafted fruit, or trees gone all to suckers and brush, does not

pay. It will pay to dig out your old-fashioned currants and grow the Red Giant and the White Grape. It will double the crop at least and more than double the market returns. My neighbor has large orchards, two of them, but neither of them pays, for the plums are covered with knot and the pears are blighted, while the apple trees have not been trimmed for thirty years. Nothing pays in the country but the best, and this grown with intelligence. Indoor waste is fully as disastrous as outdoor waste. Certainly an immense amount of food is tossed into the waste heap or fed to worthless animals, and more is lost from bad storage, as well as careless cooking; every bit of this tells on the problem whether a country home pays.

Now let us sum up this matter of a complete country home, as I have outlined it and see what it all comes to. I will let the truck farmer speak for himself. "We rented a farm of fifteen acres, one-half of it under cultivation. We paid sixty dollars for a horse and thirty for a cow, buying also a wagon, with necessary tools. This left us with a very small balance in pocket. The first year, our trucking gave us a balance of nine dollars. The next year we added fifty acres more and trucked the whole of it. We added to our stock by borrowing one hundred and fifty dollars; and at the end of this season we had twenty-five chickens, with a litter of pigs, but buying left us in debt one hundred dollars.

"The next year we sold two hundred and sixty-

five dollars worth of pigs, three cows, and four calves. We had at the end of the year no cash in pocket, but a full kit of tools and a splendid team of horses — altogether worth three hundred dollars. The next year brought us a good cash balance of three hundred and forty dollars and we have been doing better and better ever since."

The fruit grower has created a flower garden, a fruit garden, a vegetable garden, an apple and pear orchard, bee yard, hen yard, and cow yard; that is when his place is completed. If I am not mistaken, and I speak from experience as well as observation, he will from a five acre farm of fruit run on the intensive principle — that is with diversified crops, — each one carefully worked on scientific principles — at the end of the second year be about even; at the end of five years from strawberries and cherries he will take one hundred dollars, from currants one hundred to two hundred dollars, from raspberries two hundred dollars, from plums one hundred and fifty dollars, from honey seventy-five dollars, from pears seventy-five to one hundred dollars, and from apples probably not more than one hundred dollars more. He will also have his family cow and a good work horse, while his milk pans are full as well as his "butter crock" — good, sweet butter with no barn flavors — and there is an abundance of thick cream for his berries and for cereals. If he is near town he will also be selling a surplus of both milk and butter.

The other side of the problem runs about this way: you will probably need for help during the currant and berry season to the extent of one hundred dollars. For your horse and cow you will grow your own fodder, but will have to buy mill stuff for the horse at a cost of about fifty dollars per year. One dollar per week is quite enough for this expense, if your horse has plenty of alfalfa hay. The cow with slops and June cut hay will require no mill feed whatever. A good family cow is often an item of enormous expense, quite balancing all that she gives back to the family, but this is entirely unnecessary.

We have to add from fifty to one hundred dollars per year for fuel; one hundred dollars per year for groceries, including sugar and flour; a clothing bill, according to the size and habits of the family. A doctor's bill is rarely essential, where good diet and common sense dominate. Items of food can be considerably reduced by buying at wholesale. You ought to add at least one hundred dollars more for books and excursions. Add two hundred dollars for sundries.

In my judgment and with knowledge of what I am asserting, a moderate sized family, with moderate tastes and industry, can live well with an outgo of from five hundred to seven hundred dollars per year. If now we add five years more to our experiment, we shall probably not be able to add largely to the income from small fruits, but we shall be able to a good deal more than double the income from large

fruits. The apple trees that will return one hundred dollars at the end of five years will return five hundred dollars at the end of ten years and eight or nine hundred dollars at the end of fifteen years. It all depends upon your being able to get along with a small income during the first two, three, or four years of your country life.

I have seen very much better chances than I have outlined, where an old place comes into the market, somewhat out of repair perhaps, but with a good deal of fruit already obtainable. The care of such a place requires patience and scientific principles of pruning as well as feeding the trees. In Florida I have noted a large number of bearing orange and grapefruit groves sold at a nominal figure, but returning a very handsome sum the very first year. I can find places in New England where the income would be just as liberal from apples and pears. A peach orchard often drops into the market, in Delaware or Maryland, and an apple orchard in Missouri or Oregon that is as good as clear profit.

Growing for market in these days is quite a different problem from what it was before the railroads undertook to carry our produce a thousand miles to sell it. It compels our trusting middlemen with our crops. Where the market is five thousand miles away or five hundred even, the ordinary grower loses entire control of his fruit or grain as soon as he puts it on board the cars. If he gets an inadequate return it is very difficult to sift the case and secure

justice. It is for this reason that I have strongly recommended that you do not plant yourself very far from a town large enough to absorb your surplus. I am aware that this cannot always be done; but in every case you can adopt the principle that I have urged, to grow first for home use and second for market.

Make sure that your gardens are up to date, giving you the very best products of modern discovery and creation, and cutting off your expenses in every direction. Expand slowly. Leave off frills. The glory of the country is not the same as the glory of the city, either as concerns a costly house and pretentious grounds, or in the way of costly habits of eating and clothing. The glory of the country is simplicity and naturalness, under training. We need not go to the extreme of Thoreau, of living in a self-constructed hut in the wilderness, but we should leave out everything that savors of city streets — formality and artificiality. Fit yourself into companionship with the trees and keep your brains busy controlling, but not defying, growth.

Extensive farming does not come at all within the reach of these chapters. I am considering only a small country home, thoroughly cultivated. Nor am I writing for those men of wealth who exploit the country by buying up large tracts of farm land, including farm houses, and then turning them into chateaus. We have quite too much of this work going on and while it creates false ideals of homes

and home life, it is withdrawing from production some of our richest acres. This is exactly what we cannot afford to have done. We need, on the contrary, that every acre shall be brought to its maximum power to feed our increasing population.

I am writing and this chapter is specially intended for those people who are waking up to the fact that the best life for the majority of people is country life, for those who have battered themselves against the problem of earning a living at city employment and done nothing else than merely to secure daily bread. Young men I specially advise to turn to agriculture as the most hopeful of the industries. Our city boys should find places with skilled farmers, if possible, where they can secure a training supplementary to anything given by the schools. To a college graduate I would say, add now a few years at an agricultural college.

To everyone I would say this business of going into the country is not a matter of play or of sentiment; bring with you every bit of information and training that you can secure. Come out from congested life with the understanding that you cannot change your lot by merely getting away from houses and paved streets, that country life to be a success requires knowledge, industry, thriftiness, economy, and all the better qualities that make up the best human character. This is the better part of the whole story, that country life makes men, if it has good stuff to work on.

CHAPTER XIII

THE SOCIAL SIDE OF COUNTRY LIFE

COUNTRY people used to get very close together when they lived a mile apart and the woods came up everywhere within sight from the road. The forest held two-thirds of the land in those days and we built our houses along the edges. We fought wild animals in company and we joined forces for planting and harvesting; husking corn together was not only a matter of economics but of social pleasure. In those days nearly all traffic was the swapping of home-made goods, home-made food and home-made clothing; eggs went to the store for sugar and in one way and another we managed to make every little community complete in itself.

We were pioneering across the continent, apparently with no other than individual intent, but somehow groups came about and each one had its district school by the roadside, its store on one of the corners, and its log church, with a grist mill every fifty miles. Each family brought something out of its Connecticut or Massachusetts home that it divided with its neighbors. One had a few currant bushes, another some apple seeds, while a third had grass

pinks and hollyhocks. There was at least one horse and one yoke of oxen to begin with, and they all worked together for common welfare.

This was what the Pilgrims had done, and they had not hesitated to call their homes a Commonwealth. The fields were largely tilled by mutual aid; tools were used in common, and crops largely held in common. Have you ever considered the meaning of the word neighborhood? These were all neighborhoods, closely bound by common needs and coöperation, building each other's houses, and doing all sorts of things without hire. It was a meaner life that, by and by, changed all this good will into hard cash in the place of kindliness. Mothers could call on neighbors' daughters for a week's service, at any pinch, no one felt above doing house work, and no boy was above field work.

On Sunday the people gathered in one union church on the "commons," and the good of the service was quite as largely social as it was religious. The people swapped news as freely as they listened to long prayers, while friendly gossip about neighborhood matters was very justly considered of as much importance as information about the golden paved city of a future life. The day of sects and divided worship had not come in; all people were truly brothers and sisters, and neighbors they were in the sense of the parables of Jesus.

Individuality worked itself out by one making brooms, another shoes, and another weaving the

homespun rolls of the neighborhood. Yet all tilled the soil, raised their own vegetables and meat, and in every house candles were dipped, soap was boiled, carpets were sewed, quilts quilted, and the wool of the farmyard was spun into yarn — which went into homemade stockings or otherwise contributed to the clothing of both sexes.

It was a cozy life that worried very little about transportation and none at all about railroad rates or coal bills. The parson glorified God and served the community for what he could get, and there was not a millionaire in the world. In this way the United States was being made out of commonwealths, with a widening commonweal. The larger cities did not number one hundred thousand inhabitants, and the villages were merely nuclei of the farms.

The revolution that began about 1850 affected our social relations quite as much as our physical conditions. The sickle had already disappeared and now the scythe was destined to follow. Instead of a line of farmers racing across the meadows, full of the glee of rivalry, McCormick reapers marched through the grass or the grain, with one man to drive the team of horses. Indoors the humming of the spinning-wheel had already been hushed and now the quilting bee and the knitting matches made way for machinery. The sewing machine abolished sewing societies. The multiplication of newspapers and the rise of the modern magazine were at the cost of the gossiping crowds that had been accustomed to gather

news at the village tavern or the corner grocery and distribute it freely among the homes. More was heard of city life and a longing was awakened for participation in civic advantages.

Churches naturally suffered, for the country folk preferred to lie on their backs with newspaper or magazine, or to read the Bible or Uncle Tom, instead of walking two or three miles to a preaching service. Not so many cared to hear the opinion of the parson, especially as much of the literature that was now floating into their homes contradicted it. The flux of the people grew strong toward town life, where social craving could be more easily satisfied. Before the end of the century Sunday lost its supreme control over the scattered country folk. Country life was losing its zest and its unity.

The farmer who formerly swapped his veal, his vegetables, and his honey had begun to ship his cotton and his apples into regions that he himself could never visit. He must learn to trust a race of middlemen who linked him to the remote markets. He had to think of Canton and Singapore as something more than missionary stations. Everywhere coöperation became more difficult, while good will and sympathy became more necessary. It is very strange if, when shaking hands with customers half way round the globe, we shall not after awhile learn a closer friendship and coöperation with our neighbors. This was what was bound to come about.

Under the impulse of this new social demand there

grew up the Grange, spreading over every State and multiplying its groups of associates. Those who had heretofore discussed cattle and soil and tools and crops began to reach out after world problems. It was a blind progress that was made, but the progress was inevitable and sure.

About 1890 the agricultural colleges had begun to bring country work into alliance with science. All the accumulating knowledge of the world was about to be laid down at the door of the farmer. With the experiment stations bulletins were issued freely to be distributed, bringing to the front those economic questions which can only be settled by coöperation. New fruits and new flowers began to enrich rural life, and men like Burbank stood in the place of those heroes who had previously occupied public attention. Farm produce not only reached the seaboard cities, but began to get through the tariff cordon and reach the markets of the world. President McKinley invented the phrase "open door," which meant free access for Kansas corn and Minnesota wheat into the ports of Korea and South Africa. District schools began to drop into town schools and it was clear that we were in an off-clearing that looked to still more revolutionary changes.

When President Butterfield of the Massachusetts Agricultural College held a conference on rural affairs in 1908, he invited not only neighboring colleges but church associations, art associations, and all sorts of labor leagues. He argued that the time

had come when the country people must get together, pooling their interests and doing their thinking and their working in common. We must all get, he said, our culture from the corn lot. There are languages more ancient than those taught in our colleges, the languages that are spoken and sung and whistled in our fields and woods. So it was that in one way and another country life was renewing its fellowship, and coming into a new sort of associated completeness.

President Roosevelt appointed a Commission on Rural Improvement. The time has come, he argued, to abolish isolation and create again an effective community life. He outlined what he proposed as improvement of country schools, completing the tendency toward unification that would give to country children as good advantages as if they lived in town. He would see country roads made as serviceable as macadamized driveways. He hoped to see the country church re-established as a vivifying force.

More libraries and farmers' institutes with wiser lecturers might well be hoped for. Coöperative buying and marketing among farmers he especially desired, which should free them from the impositions of middlemen and transportation interests. Mutual insurance companies, community dairying, and other industrial enterprises in common met his approval. A parcels post and a postal savings bank seemed essential elements to the new country life.

The commission reported, and the report should be studied in our common schools and read in all our families, that the improvement of farm life should be pressed forward from both the sanitary side and the esthetic side, making farm homes attractive as well as economical. They would have the telephone in every house, binding together the community, without depending upon occasional trips to the tavern, while rural free mail delivery gave a daily zest to the isolated home. The commission held that the city had had its full share of attention, and that now the country fairly requires the interest of government. The centering social forces should become distributive. The appointment of this commission, which seemed to the independent farmer impertinent, was welcomed finally as giving strong propulsion to a new suburbanism and a broader country life.

Almost immediately a new phase and a most important one for country life came about in an alliance of trade and transit with the farmer. J. J. Hill, the genius of industrialism, president of the Great Northern, first announced the doctrine that railroads and farms were not in opposition, but the closest allies. President Brown of the New York Central suggested a syndicate, with sufficient capital to buy up the sixteen thousand square miles of deserted farms in New York and New England, put it in shape for use, and then resell at cost. He would provide, he said, capital for the purchasers until their first crops

were in hand. In this way the capitalist is striking hands with the laboring man to put him in shape for a country home.

This sort of coöperation, begun by corn trains, has widened into a very strong fellowship between agriculture and commerce. It is eminently wise, for the real policy of the industries is to work together. The carrying trade cannot overtax the producer without injuring itself. All peoples and all classes thrive together or they suffer together, and it is fortunate that the leaders of our industrial system are finding this out. Mr. B. F. Yoakum, Chairman of the Frisco System, said in a recent address before the Farmer's Education and Coöperative Union, "The farmers and railroads have something to coöperate with and something to coöperate for. The heavy reductions in freight rates of the last few years have been absorbed by middlemen and not shared by either the producers or the consumers."

Agricultural education which had been confined to the colleges and their bulletins was now widened by a plan of educational trains, carrying the best trained workers across the country from town to town, giving demonstrations of how to handle milk and farm crops, how best to manage the soil, in what way fertilizers were needed, and how to combat insect pests while accepting bird alliance. The first of these trains was, I think, in Illinois, but the seventh or eighth crossed the Central Lines before the end of 1910.

Naturally this new era of good will led on from farm trains to railroad farms. These are already established by several of the leading railroads, with the avowed purpose of securing the drainage of swamp lands, better plowing, with implements that will bring up the subsoil, the selection of seed of the best varieties, intensive tillage during the growing of the crops, the securing of a large amount of humus, preventing barnyard and other waste, establishing the value of crop rotation, with winter cover crops in the North and summer cover crops in the South, the retention of only the best animal stock, the production of food for men and animals on the farm itself, and finally the keeping of careful accounts as well as accurate memoranda of tests and their results.

Following this work of the railroads, the States have begun the solution of farm problems through collective action. Governor Hadley of Missouri is at the head of a well-thought-out plan, whereby that State will undertake the movement of the congested crowd out to farms, owned by the State and turned over to actual settlers at cost price. The proposition is to assist the neophytes until tillage has become remunerative.

Heretofore State action has been confined almost altogether to the patronage of State fairs. These collections of the people and their products were at one time of considerable value. They are of less importance at the present day because we do not need so much the exhibition of horse speed and immense

vegetables as we do the demonstration of soil problems and the best way of making timothy grass give us four tons to the acre. The State is needed at present to secure sanitation, industrial education, and carry the land tiller safely through crises.

The plan as it will be prosecuted by Governor Hadley is based on a general fact that most of those who are anxious to leave city congestion are moneyless as well as homeless. It is very fortunate that this is so, for all betterment schemes begin with those who are well-to-do. The wealthy have been on the move for many years, and have bought up large tracts of land, including not a few of the very richest farms, and are doing with them nothing at all in the way of adding to the production of the country. They create beautiful landscapes and elaborate houses, but that is all. Just now we are greatly in need of increasing the food products of the United States; and the poorer classes will do this, while adding to their own comforts and creating homes.

Governor Hadley has already brought about a National Farm Homes Association; this has reached over his own State to take in the whole Southwest, and to some extent the whole South. Land is purchased, as it can be in large sections, especially in Arkansas and Texas and Florida and Georgia, at ten dollars an acre or even less. It is then divided into forty acre farms, thirty-two of these being clustered about a central farm of one hundred and sixty acres. This central farm becomes the residence

of a skilled agriculturist, such as are being turned out by our agricultural colleges. He shall have general supervision of his neighbors, to bring about the most economical and thorough methods of handling soil and crops, coincident with profit.

In other words, it is a combination of school and work, very similar to what has been projected for our common schools themselves. This teacher or head of the system will attend to the marketing of products and will steadily lead the way to independence, on a basis of good judgment. The arrangement of the farms is such as to bring about a mutual exchange of social courtesies, mutual helpfulness, with games in common as well as work. There is the germ here of a new style of country life which may go much farther.

Here are the figures; land, \$400; buildings and fences, \$400; stock and teams, \$300; and tools at \$100. The first year it is proposed to exempt these purchasers from taxation. Beginning with the second year they will be expected to return what has been advanced to them, in ten yearly instalments. This it is estimated can be easily done, from truck farming, grass and grain growing, cattle and chickens.

This colony system is fundamentally sound. Life in the city is reduced to a conformity that makes it nearly impossible for the individual to act by himself. When we undertake the dissolution of the congested mass we are always met by the fact that country life is unendurably lonesome. There is also



WHERE VINES AND FLOWERS COVER THE SIGNS OF AGE

this advantage that where a dozen families are planted near each other we are able to secure a coöperation in industries apart from agriculture. In other words, we establish a community instead of a family. Two families going out together and intending to occupy twenty acres each can build their houses in adjacent corners so that their neighborliness may be felt, especially in times of sickness. It is the woman that suffers most, and by this sort of building she is not cut off from a daily chat with her neighbor.

I have seen this scheme carried out on a larger scale by four families, each building on the corner of a sixty acre lot. Their drives ran into each other, and their fields were separated only by a line of wire. These four families had a common kitchen, with breakfast room and broad verandas in the center of the plot. There is no reason why every family in the world should have its own food laboratory. By combination the labor is greatly reduced and the cost of feeding four families is cut right in two; or carry this plan farther to a group of eight or twelve. Indeed it might be made to cover as many country homes as you please, only considering convenience.

Now plant your union school at the most convenient and central point. Organize your union church and allow it to occupy the school auditorium and you have a completed community. Or you may go still farther and have your community bank in

conjunction with the post-office. Church and school are not really two offices and may be united for such a community as we suggest. Of course our aim is to secure moral and intellectual improvement, while we train the young people to the broadest ethical aims, by intellectual development.

If we conceive a system of this sort developing we shall soon find a Grange organized, holding its weekly meetings in the same school building, which is unoccupied of course in the evening for school purposes. The Grange keeps the families in close alliance and it may cover the general subject of town improvement, or there may be separately a rural art society. This last association will have for its aim to study road improvement, yard improvement, house painting, fruit growing, and all other local questions that pertain to the indoor or outdoor comfort and wealth.

This sort of community, made up of recent recruits from city life, we must presume to have brought with it a good deal of taste for music, architecture, and some of those refinements which we can very cordially welcome into country life. With all the rest, a tree commission should be appointed, so that the neighborhood and street vegetation shall not be mutilated. One of the chief troubles just now in the country is the utterly misdirected trimming that is going on. We cannot presume that our city friends will understand trees very cordially or scientifically, but in every community there is at least one person

to whom can be wisely referred this matter of community art.

The suggestion of a coöperative kitchen is not entirely novel, and it has been worked out in more ways than one. Not long since I came upon a casual note in a California paper, describing a kitchen of this sort which had become quite the center of a considerable group of homes. It was not only giving satisfaction to the mothers and wives, but was developing domestic art and establishing refinement that could scarcely be considered in individual homes. The State can aid along these lines not only by its free mail delivery and its school system and its postal savings bank, but doubtless may do a good deal, as Missouri proposes, to carry the settlers over the initial crisis. Such a movement, however, must slip naturally into the hands of the people involved.

Coöperation in drainage would seem to be so reasonable as to find no opposition, but a sewer rarely gets through a line of neighbors into a proper outlet without opposition. The same difficulty occurs with pumping water for community purposes from springs that lie among the hills. It is of the utmost importance that there shall be an abundance of pure water and the most sanitary disposal of waste. Unless you can have an artesian well, dropped down deep into rock and planted above possible infection, there must be coöperative water supplies. Your city colony will come with an instinct for this sort of united action.

To rid a neighborhood of insects also requires the fullest unity of action. One stable left uncleaned will infect a mile square with flies. One mosquito breeding cesspool is enough to infect fully as large a neighborhood with that pest. A combined effort in any community in the use of kerosene would entirely rid us of both flies and mosquitoes in a very short time. We have unnecessarily become tolerant of dangerous enemies. If you have a small lake, stock it with fish that will eat larvæ.

There is no reason why coöperation should not go somewhat farther, without encroaching on integral home life. Building in the country should not defy the very spirit of independent home life; a real house is a growth of the self, of our feelings and our aspirations. It is also a child of the spot that it occupies. A Mr. Edgar S. Chambless has invented what he calls an endless house. It may be as long as you please, and on paper it looks like the Chinese Wall, or a modernized cliff-dwellers' establishment. It is to be of cement, with a railroad in the basement, as well as any number of elevators. It will have the best of water supply and perfect sewerage. It will be lighted by electricity and heated by the same power.

This plan would save the hucksters and farmers from driving from house to house. Engineering up hill, however, and across valleys with a house wall would be liable to meet some facts of a stern sort. Still, coöperative building is likely to win consider-

able progress, as inventions multiply, not only in number but in cost. Mr. Edison's concrete house that is to be cast in a mould and served up to each family, much as grave stones are furnished to the dead, has also some features to commend it. Its adoption would at least serve to get rid of many of the unmeaning structures which are now occupied by country home makers as mansions.

Intensive farming we understand to be the tillage of a small lot in such a way as to get as much from it as others get from ten times the acreage. This brings us very much closer together. Big pastures disappear and great meadows are cut in slices, while the mile long corn fields are subdivided into apple orchards, berry gardens, and truck patches. It is a grand fact about American tillage that great cattle ranges are passing out very rapidly, while the same number of cows are fed by green soiling and silage. From these small homesteads, asparagus, lettuce, and celery, followed by beans, potatoes, and melons, keep the cars loaded nearly all the year round.

As the century gets into the twenties and thirties there will be double and then treble the number of country residences. Our cities will not grow smaller, except relatively. If you believe the present congestion is to be tolerated, I am confident that you are mistaken. Cities will widen out and open with great rifts of trees and sodded playgrounds, beside gardens innumerable. Skyscrapers are a mood, not a need, and will follow the tower of Babel. The fu-

ture city will cover three times the present space, with the same population.

The automobile, or its successor, will have a little chance of free motion without killing old people and children. Horses will be out of the problem, except for the pleasure of those who love animal friends better than they love machinery. Aërial transit will deliver most of the goods that are sold and allow the storage houses and stores to be at a much greater distance from the shoppers.

Suburbanism will spread out for miles beyond the core of population, and every home will be surrounded by its adequate garden. Still farther from the roar will be the intensive garden and farm, and you will find a population of six hundred millions, well fed and housed, without isolation and without crowding. We have made immense strides in the way of tools and trolleys,—something to work with in the soil and vehicles to convey our produce to market. Mr. Edison is now testing the limits of his storage battery that will need charging only once in one hundred and fifty miles. We are not very far from a motor that will carry our produce to market at an insignificant cost.

I believe in private customers as far as possible, but for the majority of the producers this is impossible as things are. Our surplus goes to middlemen, whose interest is of course to get a large share of the profits for themselves. Neither do they understand how to handle my pears and your strawber-

ries in such a way as to bring them to the consumers without loss. We shall see the vehicle before long that will speed the producer to the consumer, over a distance of twenty-five or thirty miles each morning.

Our present limitations for producers who must touch customers early in the day is about ten miles — possibly twenty for non-perishable products. This creates a narrow zone about each city, outside of which there is a very restricted opportunity for the gardener and orchardist. We need and must have this zone widened to forty or fifty miles. In that way we shall equalize conditions, and turn the whole land into one overspread garden. The automobile points the way to this most desirable country life. We must have State roads, smooth for transit, so that produce wagons may reach a safe speed of twelve miles an hour.

But are we quite sure, in this forest of telephones, trolleys, autos, and other discoveries and inventions that are crowding the beginning of the twentieth century, that ere long city purchasers will not come our way more than we go theirs, speeding among the country homes, before breakfast, to find what they want for the day's supply, instead of waiting to have it brought to their doors? It is not quite clear how far aviation may help along this line.

We shall plow together and reap together and possibly store together. Why not? We do this as soon as our goods leave home; why is it impossible

as soon as they are harvested? Is it after all a permanent necessity that each and every country home shall have its own separate barns and storage cellars? When grain is threshed coöperatively and marketed coöperatively; when all of our homes have swift motors, adjusted to farm work, why may there not be grain elevators for an associated group of homes and fruit storage houses for a whole group of families? I am not so sure but that the future country home will lose its barns, as I have suggested it may also lose its kitchen and its cellars. This would certainly contribute greatly to the esthetic side, as well as to the sanitary side of country home making. There would be no lack of individualism if social life should go even farther.

One thing is assured: the dream of the farmer has greatly changed of late. His vision is no longer that of an isolated house, quite distinctly severed from association with its neighbors, and while in one sense complete by itself, seriously lacking in its power to move with the world's evolution. He begins to think of a parked farm community, raying out from a central school and library and closely associated in almost all conceivable ways through miles of extent. The vision does not as yet go beyond the rural free delivery of mail and the use of automobiles for market purposes and for tillage, but he has an enthusiasm over something that is to make country life marvelously beautiful and rob it of its most severe features of isolation and toil.

These dreams are likely to lead him into schemes that are half thought out and to put him into the power of heartless speculators. In bidding good-bye to my readers I wish to remind them that I have already warned them that they should rarely buy land that they have not themselves inspected, and that a large part of the speculative projects for country home making in common are treacherous efforts to get the money of the common people without any adequate returns.

As immigration comes to a final balance and there is no longer a rush of the dissimilar and undigested social element, we shall react to a nearer social equality. Many years ago our fathers were on a level; we will be on another, but a higher level. Better tools always mean better men and women; and better folk in turn mean better fruit and better animals — more intelligent coöperation between all that goes to make up the country home, dogs, horses, bees, birds, flowers, fruit, and human folk. Every relic of barbarism tends naturally to drop off; thorns will be eliminated from berries as well as roses; strawberries will be as large as pears, and blackberries will grow without spines. Progress is not a chance achievement, but the law of Nature as applied to horticulture.

We shall master even climate after awhile. We are already reaching out in this direction, by the conservation of our forests and the drainage of our swamps. Things have gone heretofore on this conti-

nent very much haphazard. A few men have been allowed to destroy the wind-breaks of vast territories, allowing the blizzard to sweep over territory that God protected by forests. Clean down to Florida the oaks and the pines have been wasted, till there is nothing to stop the fury of a storm that begins in Alaska. If you should ask me for some specific term by which to designate the coming era, I would call it the era of wind-breaks—the time when everyone will understand the sacredness of trees and will know their social importance.

The more you study this matter the more you will be confirmed in the view that Nature has ordered coöperation everywhere, and when it comes about that we appreciate fully our social duty and civic obligation, there will be a deal less failure to win a good living. The country home is in reality an alliance, a treaty not only of peace but of friendship between all things that live and the Life that permeates all things. I should like to have you read "Mutual Aid," a book written by Prince Kropotkin, for it shows how fundamentally the law of good will operates through Nature. Antagonism is not at all a controlling principle, and there is nothing that shows this better than a true country home, where colliers and cows coöperate, bees and flowers associate, and over all and through all presides the good will of the human director. Darwin has shown how even the angleworms serve as plowmen and subsoilers.

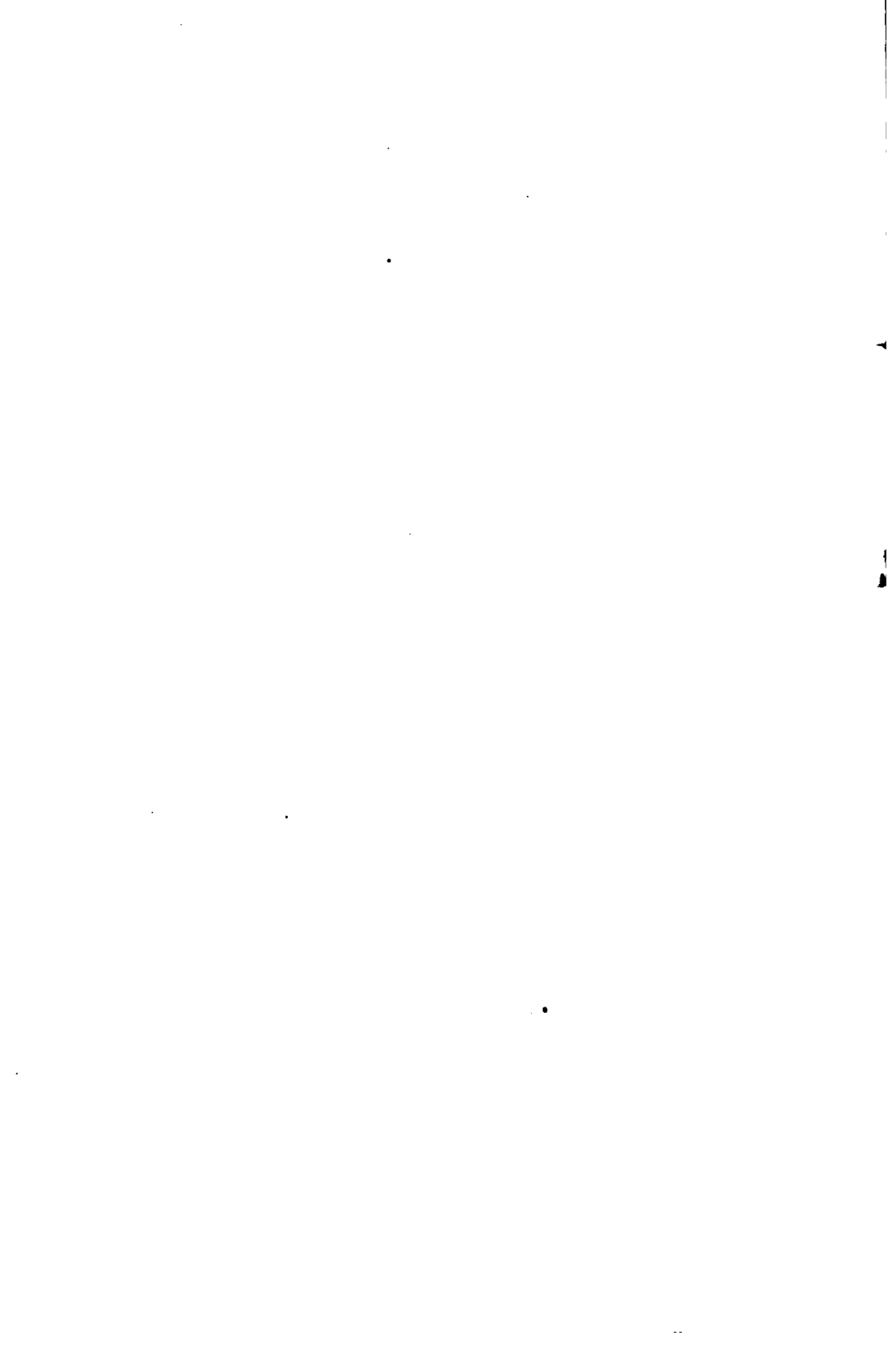
If you think we are at an end of evolution you are mistaken. The parcels post has got into every political platform and is acknowledged by all parties as a social necessity. Telephones are probably as cheaply afforded as possible already, but there is no reason why they shall not transmit to a group of homes lectures and debates. The telephone tea party I have already mentioned, but it is in all soberness a part of coming country life, when our homes will be something more than individual retreats, when they can be practically, if temporarily, lecture halls. The school will no doubt yet be, in this way, so associated with our homes that the old and the young will be at school together.

The agricultural college is steadily becoming associated with farms and is likely to go much farther in the same direction. It really is itself a great farm, thoroughly practical and experimental. The professors of gardening and agronomy become naturally associated with us in our outdoor work, while indoors we have a new sort of trained leaders in domestic economy and domestic science. As a matter of fact, these men and women are taking their places as social leaders, not as mere recluses or scholars, but knowing the practical things that make for prosperity, they teach it to the people. College is hardly a descriptive name for these institutions, for that word has become identified too closely with schools where scholarship is the end and not the means.

Mr. Roosevelt in one of his most pungent ad-

dressess, says, "I warn my countrymen that the great recent progress made in city life is not a full measure of our civilization; for our civilization rests at bottom on the wholesomeness, the attractiveness, and the completeness, as well as the prosperity of life in the country. The men and women on the farms stand for what is fundamentally best and most needed in our American life. Upon the development of country life rests ultimately our ability, by methods of farming requiring the highest intelligence, to continue to clothe and feed the hungry nations; to supply the cities with fresh blood, clean bodies and clear brains, that can endure the strain of modern life; we need the development of men in the open country, who shall be the stay and strength of the nation."

I advise you to get a home in the country, not only for your individual comfort, but because it places you in a relation to the world of high responsibility. I advise you to educate your boys and girls for the most intelligent farm life. I advise you to stop glorifying worklessness and honor achievement. Work goes beyond economics; it is God-like. It is not a myth of history that the divine mind planted a garden. "My Father," said Jesus, "is a worker and I also work." Luther graved on his seal, "*Laborare est orare*," to work is to worship. This great movement outward from congested life must be understood in its breadth as well as its intensity. It is to make the American Republic safer and stronger, as well as natural life more wholesome.



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